SMITHSONIAN MISCELLANEOUS COLLECTIONS.

194

LAND AND FRESH WATER SHELLS

OF

NORTH AMERICA.

PART I.

PULMONATA GEOPHILA.

BY

W. G. BINNEY AND T. BLAND.

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PREFACE.

At the request of the Smithsonian Institution I have prepared the following Manual of the Land-Shells of North America, based on the "Monograph of the Terrestrial Air-Breathing Mollusks of the United States." I have copied the descriptions and figures of the species described in the four volumes of that work, enlarging the synonymy and adding to the notes of geographical distribution. The more recently discovered species are also described, the whole subject being brought down to January, 1868.

The geographical limits of my work include all of North America from the extreme north to the Rio Grande and to Mazatlan.

In the preparation of the work I have been greatly aided by my friend Mr. Thomas Bland, of New York. The elimination of some of the most difficult groups is to be accredited solely to him. He has, indeed, been so thoroughly identified with the work that I have obtained permission to use his name on the title-page, thus giving additional authority to the work.

Most of the figures have been drawn by Mr. E. S. Morse, of Salem, Mass.

W. G. BINNEY.

Burlington, N. J., February, 1869.

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LAND AND FRESH-WATER SHELLS OF NORTH AMERICA

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LAND AND FRESH-WATER SHELLS

OF

NORTH AMERICA.

I.

ORDER PULMONATA.

LINGUAL membrane short and broad; teeth numerous, uniform, in numerous transverse rows. Mouth usually with horny jaws. Respiratory organ in the form of a closed chamber lined with pulmonic vessels on the back of the animal and covered by the shell; edge of the mantle attached—the entrance to the air-chamber being through an opening in the side, closed by a valve. Operculum almost universally absent. Animal hermaphrodite, with reciprocal impregnation, generally oviparous, terrestrial, fluviatile or marine, but respiring free air. Tentacles and eye-peduncles retractile or contractile.

Shell varied in form, sometimes rudimentary or wanting.

Eyes at the end of elongated peduncles, or on the head of the animal.

The Pulmonata are usually divided into three suborders—*Geophila*, *Limnophila*,[1] and *Thalassophila*[2]—names derived respectively from the terrestrial, fluviatile, and marine habits of the animals.

SUBORDER GEOPHILA.

Eyes at the tips of elongated, cylindrical peduncles; tentacles retractile or contractile, cylindrical, shorter than, and placed under, the eye-peduncles, sometimes very small or wanting.

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[1] See Land and Fresh-water Shells, II, p. 1.

[2] Ib. p. 152.

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Operculum never present in the adult. Animal usually terrestrial.

I have adopted the systematic classification of the *Geophila* proposed by Dr. J. E. Gray, which seems to express more satisfactorily than that of others, their natural systematic arrangement. Its general characters are as follows:—

A. *Head, eye-peduncle, and tentacles retractile under the skin.*

Sect. 1. VERMIVORA. Buccal mass very large, elongate, projectile like a proboscis. Jaw none; teeth numerous, slender, conical, distant. Mantle well defined. Subterraneous; carnivorous, or worm-eating.

Sect. 2. PHYLLOVORA. The buccal mass small, ovoid, not produced. Jaw distinct, horny;[1] teeth numerous, four-sided, close together on the lingual membrane. Herbivorous.

B. *Head, eye-peduncle, and tentacles simple, contractile.*

I use these subdivisions because I believe they exist in nature, and with the same understanding do I use the divisions of families and genera. The subgenera which I adopt in the following pages I consider merely artificial divisions, used for convenience in dealing with genera abounding in numerous species.

It will be seen that I have usually adopted for the larger divisions the descriptions given by H. & A. Adams—for genera and subgenera those of Albers and Martens. From the last named I have also usually adopted the subgeneric names, without inquiry into their precedence, having neither time nor inclination to attempt myself to disentangle the confused synonymy.

In the synonymy of the species I have quoted only authors giving a description or figure. I have personally consulted all the references, unless otherwise specified.

The subject is brought down to January, 1868.

HABITS, &c.—They live mostly in the forest, sheltered under the trunks of fallen trees, layers of decaying leaves, stones, or in the soil itself. In these situations they pass the greater part of their lives. In the early days of spring, they sometimes assemble in considerable numbers, in warm and sunny situations, where they pass hours in indolent enjoyment of the warmth and animating influence of the sunshine. Whether these meetings serve any useful purpose in the economy of the animal, or are caused by the pleasurable sensation, and renewed strength derived from the warmth of the situation after the debility of their winter's torpidity, is uncertain; it is probable, however, that they precede the business of procreation. It is certain that they last but a short time, and that after early spring, the animals are to be found in their usual retreats.

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[1] Except in *Cylindrella.*

In the course of the months of May or June, earlier or later, according to the locality and as the season is more or less warm, they begin to lay their eggs. These are deposited, to the number of from thirty to fifty and even more, in the moist and light mould, sheltered from the sun's rays by leaves, or at the side of logs and stones, without any order, and slightly agglutinated together. The depth of the deposit is usually measured by the extreme length of the animal, which thrusts its head and body into the soil to the utmost extent, while the shell remains at the surface; but sometimes the animal burrows three or four inches deep before making the deposit, in order to insure a sufficiently moist position. Three or four such deposits, and sometimes more, are made by one animal during the summer and autumn. When the deposit is complete it is abandoned by the animal. The eggs vary in size according to the magnitude of the species producing them. They are nearly globular, one axis being somewhat longer than the other, white and opaque. They consist, in general, of an external, semi-calcareous, elastic membrane investing the whole, the interior surface of which is usually studded with numerous rhombic, microscopic crystals of carbonate of lime, some species however having a hard enveloping calcareous shell, of the consistence of that of a bird's egg; of an inner thin, transparent, shining membrane which immediately incloses a transparent and somewhat viscid fluid, analogous to the albumen of bird's eggs; of the albumen itself, and of the vitellus, which, possessing the same degree of transparency as the albumen, cannot be distinguished from it at this time. The elastic eggs when first laid are often flaccid, and seemingly only half full of fluid, but they soon absorb moisture and become distended. The embryo animal, with its shell, is observable in the albuminous fluid in a few days after the egg is laid. Its exclusion takes place, under ordinary circumstances, in from twenty to thirty days, according to the state of the atmosphere. Warmth and humidity hasten the process, while cold and dryness retard it to an almost indefinite extent. The hatching of eggs laid late in the autumn is often interrupted by the approach of cold weather and of snow, and delayed until the next spring.

The young animal gnaws its way out of the egg, and makes its first repast of the shell which it has just left. It consists at first of about one and a half whirls, the umbilicus being minute, but open. Its growth is rapid, and it has usually increased in magnitude three or four times, before the close of the first year.

In the month of October, or at the epoch of the first frost, the snail ceases to feed, becomes inactive, and fixes itself to the under surface of the substance by which it is sheltered, or partially burrows in the soil, and with the aperture of the shell upward, disposes itself for its annual sleep or *hybernation.* Withdrawing into the shell, it forms over the aperture a membranous covering, consisting of a thin, semi-transparent mixture of lime mucus or gelatine, secreted from the collar of the animal. This membrane is called the *epiphragm.* It is formed in this manner: The animal being withdrawn into the shell, the collar is brought to a level with the aperture, and a quantity of mucus is poured out from it and covers it. A small quantity of air is then emitted from the respiratory foramen, which detaches the mucus from the surface of the collar, and projects it in a convex form, like a bubble. At the same moment, the animal retreats farther into the shell, leaving a vacuum between itself and the membrane, which is consequently pressed back by the external air to a level with the aperture, or even farther, so as to form a concave surface, where, having become desiccated and hard, it remains fixed. These operations are nearly simultaneous, and occupy but an instant. As the weather becomes colder the animal retires farther into the shell, and makes another septum, and so on, until there are sometimes as many as six of these partitions. The circulation becomes slow, the pulsations of the heart, which in the season of activity vary from forty to sixty in a minute, according to the temperature of the air, decrease in frequency and strength, until they at length become imperceptible. The other functions of the body cease, and a state of torpidity succeeds, which is interrupted only by the reviving heat of the next spring's sun. During the months[1] of April or May, on the accession of the first warm weather of the season, the animal breaks down and devours the membranous partitions, and comes forth to participate in the warmth and freshness of the season. At first it is weak and inactive, but recovering in a short time its appetite, resumes its former activity.

The season of hybernation continues from four to six months. The final cause of this extraordinary condition is undoubtedly to enable the animal to resist successfully the extreme reduction of temperature, and to survive through the long period when it must, in northern climates at least, be entirely destitute of its usual food. With a view to the first purpose, a place of shelter is provided, and the aperture of the shell is hermetically sealed by the epiphragm or the hibernaculum; for the second, the state of torpor is adopted, during which the functions of digestion, respiration, and circulation being suspended, and all the secretions and excretions having ceased, there is no drain upon the strength and vitality of the animal, and no exhaustion of its forces. Hence it comes forth, at the end of the period, in much the same condition in which it commenced it, and resumes almost immediately its usual functions and habits. So entire is the cessation of the function of respiration, that the air contained between the epiphragm and the animal is found to be unchanged. The circulation, however, may be partially restored by a small degree of heat, the warmth of the hand being sufficient to stimulate the heart to action.

The snails pass the greater part of their lives under dead leaves and logs, under stones, or burrowing in the ground. They seldom come from their lurking places while the sun shines, and indeed are never seen ranging in the daytime unless the day be damp and dark. Should they then be surprised by the appearance of the sun, they immediately take shelter from its rays, under some cover or on the shaded side of the trunks of trees.

Their natural food is vegetable; and the formation of the mouth and the organs with which it is armed seems to be peculiarly well adapted for cutting fruits and the succulent leaves of plants. The dental edge of the upper jaw being applied against the substance to be eaten, the semilunar rough instrument, which

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[1] In New England, earlier in more southern latitudes.

Spallanzani calls the *tongue*, is brought up against it, cutting out and carrying into the mouth semicircular portions of nutriment. This operation is carried on with great rapidity, and the substance to be eaten soon disappears. It is certain, however, that some species[1] are also fond of animal food, and sometimes prey upon earth-worms, their own eggs, and even upon each other; but the slowness of their motions and their consequent inability to pursue prey forbids the idea of their being dependent on animal food. They, in their turn, become the prey of various birds and reptiles; and it is no uncommon thing to observe, in the forest, clusters of broken shells lying on logs or stones which have been chosen by birds as convenient places for breaking the shell and extracting the animal.

The snails of the United States are for the most part solitary in their habits, differing very much, in this respect, from the snails of Europe. It is true that in localities favorable for their residence they may be collected in considerable numbers; and especially is this the case in the States north of the Ohio River. But even there, they seem to live independently of each other, and not to unite into herds or communities. There are occasional exceptions, however, as in the case of *Helix alternata*, very large numbers of which have been observed collected into a small space, especially in winter, as if for the purpose of imparting warmth to each other. The few species of European snails which have been introduced retain their native habits. *Helix hortensis*, for instance, which has been transplanted to some of the small islands in the vicinity of Cape Ann, is found there in countless numbers, literally covering the soil and shrubs. It is worthy of notice also, that each island is inhabited by a variety peculiar to itself, showing that the variety which happened to be introduced there has propagated itself, without a tendency to run into other variations. Thus, on one islet we have the yellowish-green, unicolored variety, once described as *Helix subglobosa;* and on another, within a very short distance, we find a banded variety, and none others.

In regard to colors, our snails are quite plain and exceedingly uniform; in this respect, also, differing essentially from the species of the old world. They vary from yellowish-green through horn-color to chestnut, most of them being simply horn-colored. This is perhaps owing to the fact that our species do not infest our gardens and open fields, but are generally confined to forests, sheltered under logs and stones, and are rarely seen abroad except during twilight or on damp and dark days; indeed, they almost entirely disappear as the forests are cut down, and seem to flee the approach of man. The European species, on the other hand, follow in the track of cultivation, and are common in gardens and fields, on walls and hedges, and other places exposed to the action of light. With the exception of *Helix alternata* and *H. varians*, *Achatina fasciata*, &c., there is scarcely a species having bands or variegated colors inhabiting eastern North America; and even there these latter species can scarcely be regarded as an exception, as they are only to be found at the southern part of Florida, and are more properly West India shells. In Texas, and beyond the Rocky Mountains in Oregon and California, many of the species have one or more bands.

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[1] These are characterized by the lingual dentition: see *Vermivora*.

Another peculiarity of the American snails is the tooth-like appendages with which the aperture of a large proportion of them is armed, and which are characteristic of the group designated by Férussac under the name *Helicodonta*. More than one-half of the whole number, and more than three-fourths of those with reflected lips, are thus provided. In some species these appendages assume the form of folds rather than teeth; and in others we have simple threads or laminæ revolving within the aperture in the course of the spire. They are not formed until the shell has attained its full growth.

The genera not furnished with an external shell were grouped into one family of *Limacidæ* by Binney, who thus describes their habits: They are more especially nocturnal than the other families of the order, and they are so rarely visible in the daytime that thousands may be near without being known. The injury which they commit in kitchen-gardens, for this reason, is often vaguely ascribed to worms or to birds; and no measures are taken against the real culprits. Their habits, in general, coincide with those which have been described as distinguishing the order; and we shall therefore mention here only those which are peculiar to them. They differ from the other families in not possessing the faculty of hibernation, or suspension of their organic functions during the cold season. In temperate latitudes, the snails hibernate, under all circumstances, on the approach of cold weather; the slugs, on the contrary, having the power of resisting extreme cold, continue in their usual haunts until severe frosts set in, when they retire into the earth and other sheltered retreats. Here they remain in a state of inaction and partial torpidity; the functions of the body, however, still going on, though slowly and with diminished force. A slight increase of heat arouses them and stimulates their organs to renewed action, and they accordingly often come abroad in mild weather, even during the winter. Those which inhabit cellars and other protected situations, are in motion throughout the year; and individuals of all the genera and species which we have kept in confinement have continued active, fed freely, and increased in size as much in the coldest months as in the summer.

All the species which have yet come under our notice possess the power of suspending themselves in the air by a gelatinous thread. This they effect by accumulating a quantity of tenacious mucus at the posterior extremity of the foot, which they attach to the object from which they are to commence their descent; then, loosing their own hold, they hang suspended by this point. Continuing the secretion, their own weight attenuates the mucous attachment, and draws it out into a thread. As this dries and hardens, a fresh supply is afforded, the thread is lengthened, and the animal lets itself down any desirable distance. At this time, also, the margin of the foot pours out mucus freely, and during the whole operation the locomotive disk is in active undulatory motion, in the same manner as when in ordinary progression. It appears in this way to guide and force towards the extremity the mucus which is secreted on its surface, and which, collected at its extreme point, forms the thread. The slug often pauses in its descent, and extends its tentacles and its whole body in various directions, as if seeking some object on which to make a lodgment. The faculty of suspending themselves in this manner indicates that they pass some part of their lives on trees, from which they can thus make a convenient descent to the earth; there are some species, indeed, which are stated to inhabit trees almost exclusively. It may serve also as a means by which they can suddenly escape from the attacks of their enemies, and particularly of birds. It is mostly, however, when they are young, or at least not grown to their full size, that they enjoy this power.

Those which have attained their extreme dimensions and weight are too heavy to trust themselves to so frail a support. They have no power to elevate themselves again, and in this respect are inferior to the spiders, which can both lower and raise themselves by the aid of the secreted thread. Like the spiders, however, they often remain suspended in mid-air for a time, and it is not unlikely that there is some pleasurable sensation connected with the act, which induces them thus to prolong it. We have seen the descent actually practised by every one of our Atlantic species.

Besides the watery fluid which at all times lubricates the integuments, the animals can, at their will, secrete at any point, or over the whole surface of their bodies, a more viscid and tenacious mucus than is usually exuded. This power is used as a means of defence. Whenever a foreign substance touches them, immediately a quantity of this mucus, of the consistence of milk and nearly of the same color, is poured out and forms a kind of membrane interposed between themselves and the irritating substance. So, also, when they are surrounded by a corrosive gas, or are thrown into water or alcohol, they form over themselves in this way a thick protecting covering, which is undoubtedly a non-conductor of heat and impervious, at least for a time, to liquids. Shielded by this coating, they can live the greater part of a day immersed in water, and for a shorter time in alcohol; and M. Férussac asserts that they have survived for hours in boiling water. They leave a trace of their usual secretion on every object over which they pass, and thus can easily be traced to their retreats. The ordinary secretion is most abundant at their posterior extremity. The secretion of the mucous fluid over their surface is necessary to their existence. Death immediately follows the failure of this power, and is preceded by the drying up of the skin.

All the species are extremely voracious, and devour an incredible quantity of food in a short time. Those found in this country are generally supposed to be vegetable feeders, but nearly all of them subsist occasionally upon dead animal matter, of which they seem to be fond, and when in confinement sometimes attack and devour each other; and the foreign genus, *Testacella*, is known to prey habitually upon earth-worms. It is probable, therefore, that in their natural condition, all of them

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at times resort to animal food, and devour earth-worms, insects and their larvæ, and such other animals as, inhabiting the same retreats, are like themselves slow of motion and defenceless. It is certain, however, that the principal food of those species which frequent the neighborhood of houses and gardens, consists of the tender leaves of succulent plants and of ripe fruits. Upon these, in Europe, they perpetrate serious ravages, often destroying in a night the labors and hopes of the gardener, and in some years committing so much injury, and interfering to such a degree with the prosperity of the agriculturist that they are ranked among the scourges of the country. Like caterpillars, locusts, and rats, they are considered to be perpetual enemies, and a war of extermination is carried on against them. To limit the extent of the evil, many remedies have been proposed, and among others the prayers and exorcisms of the church have been claimed, but without any considerable abatement of it. Happily, we are not in this country subject, in the same degree, to the mischief done by these animals, for their excessive increase is kept in check, probably, by the vicissitudes of the climate; but it may be useful to know that a border of ashes, sand, or sawdust, laid around the bed containing the plants it is desired to protect, will prove an impassable barrier to the slugs, so long as these substances remain dry. When the slugs attempt to pass the barrier, they become entangled in the dry ashes or sand, which envelops them entirely. The particles of these adhere to the viscid surface of the animals, who, in vain endeavoring to disengage themselves from them by secreting new mucus, at length become exhausted and die.

Their growth is remarkably rapid. We have known the young to double their size and weight in a week. The earliest hatched young of the season generally attain their full maturity before the end of the first year, although they may afterwards increase somewhat in bulk. Those which leave the egg at a later period, mature during the second year. Individuals kept in confinement and fully fed reach a much greater size than when in their natural condition.

They possess, in a remarkable degree, the power of elongation and contraction of the body. When fully extended it is long, narrow, more or less cylindrical, and generally terminating in a sharp point. The carina of the carinated species disappears.

The head is protruded far beyond the mouth; the eye-peduncles are long, slender, and graceful. The mouth is changed from an oval to an elongated form, with parallel sides and rounded ends. The glands are lengthened, lose their prominence, and appear nearly smooth. But when alarmed by the touch of a foreign substance, an instant change occurs, and a sudden contraction takes place. The tentacles are retracted and the head is drawn under the mantle. The anterior edge of the mantle is brought to the level of the foot, and its form becomes nearly circular. The body is shortened to one-fourth of its former length, and tumid; the back is rounded and rises high in the centre, and the skin is rough with prominent glandular protuberances. The carina, when it exists, becomes conspicuous. This is the form which they assume in their retreats when they retire to protect themselves from the effects of drought and cold. It differs so much from their form when in motion, that one not well acquainted with them would hardly recognize the same animal in its new shape. It is among the *Limaces*, perhaps, that the change is most striking, and the difference of form between the extremes the greatest.

They commence reproducing their kind as early as the end of the first year, before they have attained their full dimensions, and hence the eggs of the same species often vary considerably in size. These are deposited in a cluster of thirty, or thereabouts, in the soil and in other moist and protected situations; or if the species be one that frequents houses, then in the crevices or corners of the walls or under the decaying planks of cellars. In general form and appearance they resemble the eggs of the shell-bearing genera, but differ from them in several important particulars. The eggs of the snails are all opaque, while those of the slugs are more or less transparent, permitting, in the *Limaces*, a view of the cicatricula, and affording an opportunity of observing its developments. Those of the former are all deposited free, or unconnected, except by a slight agglutination; those of the latter, in some of the species, are connected together by a prolongation of the outer membrane at their longest diameter, thus forming a sort of rosary. The deposits of eggs, when made, are abandoned by the slug, who then removes to some other convenient place. A considerable number of separate deposits are made during the year.

The slugs, and some species of snails were considered by the Romans to possess medicinal properties, and this belief continued, among the nations of Europe, through the middle ages down to comparatively recent times. There is hardly a disease, internal or external, of man or the domestic animals, in which, according to the statements of authors, they have not proved beneficial; and the relations concerning them are numerous and truly marvellous. The testaceous rudiment of the *Limax* acquired in this respect a pre-eminence above the animal itself, and enjoyed a high rank among the numerous bezoars and amulets which were supposed to protect the body from evil influences, and to impart health and activity to its various functions.[1] The accounts of their virtues, copied from one author to another, on the authority of names, show how easily error is perpetuated, and how difficult it is to eradicate from the public mind a false opinion which has once obtained a footing. A full relation of all the absurdities which gained credence, would form a curious page in the history of credulity and superstition. The more general diffusion of knowledge at the present day has dispelled these ideas in a great degree: but some relics of them still linger among the rural population of many parts of Europe. In this country, no such belief has ever prevailed; and so hidden and clandestine are the habits of the animals, that but a small part of the population is aware of their existence, and those who are familiar with them view them with such feelings of disgust as would effectually prevent their use either as medicine or as food. They have also from very early times been used in the preparation of cosmetics; and the water procured from them by distillation, no longer than two or three centuries ago, was much celebrated and used by ladies, to impart whiteness and freshness to the complexion.

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[1] As late as the close of the sixteenth century, Helling published a dissertation with this title: "*Ossiculorum limacum usus in febribus.*" During the year 1863, a syrup of snails was prescribed to members of my family by two regular French physicians in Paris.

A. *Head, eye-peduncles, and tentacles retractile under the skin.*

Sect. I. **Vermivora.** Buccal mass very large, elongate, projectile like a proboscis. Jaw none; teeth numerous, slender, conical, distant. Mantle well defined. Usually subterraneous; carnivorous, or worm-eating.

Family OLEACINIDÆ.

Lingual membrane long, narrow; teeth uniform, pointed, distant, arranged *en chevron*, recurved, apex directed backwards.

Jaw wanting.

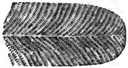
Body very long, attenuated, spiral, protected by a well-developed shell. Head with a retractile, projectile buccal sack. Eyes near the ends of long, cylindrical, retractile peduncles; tentacles moderate, retractile; labial processes developed into curved, flat, triangular feelers. Mantle thin, covered with a shell, capable of containing the whole animal; respiratory orifice on the right side, beneath the margin of the shell. Foot elongate, narrow, without any distinct locomotive disk, simple posteriorly. Vent near the respiratory orifice. Orifice of reproductive organs someways behind the right eye-peduncle.

Shell spiral, oblong, flesh-colored, outer lip thin, acute; aperture long and narrow.

GLANDINA, Schum.

Shell oblong, fusiform, horn-colored, whirls 6–8, the last attenuated at base. Aperture narrow, elliptically-oblong; peristome simple; columella twisted forward at the base and truncated. Suture often crenulated or margined. Uniform in color or ornamented with longitudinal, usually brownish streaks.

Fig. 1.

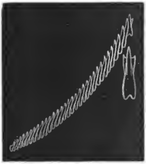


Lingual membrane of *G truncata.*

There is no horny jaw.

Lingual membrane narrow, with chevron-shaped rows of uniform,

Fig. 2.



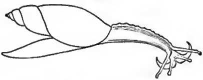
Lingual dentition of *Glandina truncata*.

curved, thorn-like teeth; centrals[1] long, slender, straight, widened at base.

Subgenus **GLANDINA**, s. str.

Shell ovate, or ovate-oblong, plicately-striate, generally of a silken lustre, but never glittering, and usually decussated with delicate revolving lines; suture crenulated; aperture equalling about half the shell's length, its peristome simple.

Fig. 3.



Glandina truncata, one-half the natural size.

Body elongated, narrowed anteriorly; eye-peduncles long, having the eye spots on the posterior face, behind the tips, which are deflected; tentacles half the length of the eye-peduncles, bulbous, and somewhat deflected at tip; on each side of the oral aperture is a retractile, palpiform appendage, attenuated at tip, and more or less recurved, nearly as long as the eye-peduncle, the bases separated by a fissure in front; buccal pouch capable of a proboscidiform protrusion, the aperture furnished with three papillæ above and three on each side; lingual organ semioval, armed with oblique ranges of recurved hooks. Genital orifice at some distance behind the right eye-peduncle. Carnivorous, feeding on other snails.

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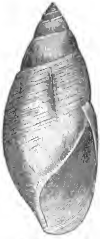
[1] Albers and Martens describe the lingual membrane as having no central line of teeth, and it is so figured by Leidy in the Terrestrial Mollusks (II, 303). Morse has detected a central line as figured above. In comparing the lingual membrane with that of the *Helicidæ* it may be said that the lateral teeth are entirely omitted, the uncini alone being present: in *Zonites* the uncini are equally prominent, and the laterals very few; in *Macrocyclis*, also, no laterals are present.

Fig. 4.



Glandina vanuxemensis.

Glandina vanuxemensis, LEA.—Shell elongated, ovate-fusiform, thin and fragile, considerably transparent, pale fawn color, in some specimens inclined to greenish, and generally flecked with distant, pale spots; the surface is, in a measure, coarsely granulated by the decussation of longitudinal and revolving lines, the latter of which are more distant from each other than the former, and become less and less distinct towards the anterior portion of the whirl; whirls seven or eight, the apical ones smooth and forming a mammillary tip; suture crenulated; aperture about one-half the length of the shell, nearly three times as long as broad; columella strongly arched, and scarcely glazed by enamel. Length of axis 68, breadth 25 mill.

Glandina vanuxemensis, LEA, Trans. Am. Philos. Soc. V, 84, pl. xix, f. 78, Obs. I, 196 (1837).—PFEIFFER, Symbolæ, III, 91.—BINNEY, Terr. Moll. II, 299, pl. lxii, f. 1.—W. G. BINNEY, T. M. IV, 141.

Glandina vanuxemii, TRYON, Am. Journ. Conch. II, 226, pl. 1, f. 6 (1866).

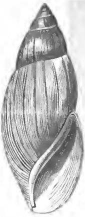
Achatina vanuxemensis, REEVE, Conch. Icon. pl. xiii, f. 48.—PFEIFFER, Monog. Helic. Viv. II, 294.

Oleacina vanuxemensis, PFEIFFER, Brit. Mus. Cat. 36; Mon. Hel. IV, 643.

Texas and Mexico.

Glandina truncata, GMELIN.—Shell strong, ovate-fusiform or ellipsoidal, obtuse at tip, of a pale ashy fawn color, or rather alternately striped with ash color and fawn color, and more or less tinted rose color, the surface shining and delicately fluted with longitudinal, raised, and rounded striæ; whirls six or seven, moderately convex, the last constituting three-fourths the length of the shell, somewhat compressed at the middle, so as to become in a measure cylindrical, narrowing forward and rounded at base; suture strongly marked, delicately crenulate; aperture about one-half the length of the shell, often more, and twice as long as

Fig. 5.



Glandina truncata.

broad, narrow, ovate-lunate, acute posteriorly, obtusely rounded anteriorly; lip nearly rectilinear at its middle portion, and springing somewhat forwards; columella arched at its lower portion, and decidedly truncate at tip; throat salmon colored, edge of lip pale. Average length 37 mill., often very much longer; breadth somewhat more than one-third the length.

Bulla truncata, Gmelin, p. 3434.

Buccinum striatum, Chemnitz, IX, 36, tab. cxx, f. 1028, 29?

Bulimus striatus, Bruguière, Encycl. Meth. I, 366.

Cochlicopa rosea, Férussac, Prodrome, 356; Hist. des Moll. pl. cxxxv, f. 3, pl. cxxxvi, f. 6–10.

Achatina rosea, Deshayes, Encycl. Meth. II, 10 (1830); ed. Lamarck, VIII, 313.

Achatina striata, Deshayes in Lam. ed. 3, III, 381.—Chemnitz, ed. 2, tab. iii, f. 3, 4.

Achatina truncata, D'Orbigny, Moll. Cub. I, 163, pl. x, f. 13.—Reeve, Conch. Icon. pl. xiii, f. 47.—Chemnitz, l. c. (Bul.) tab. xxxviii, f. 21, 22 (Achatina), No. 78.—Pfeiffer (nec Glandina), Mon. III, 512.

Polyphemus glans, Montfort, Conch. II, 415, f. civ (1810).—Say, Journ. Acad. Nat. Sci. 1, 282 (1818); Nich. Enc. ed. 3 (1819); ed. Binney, 13, 7.—Férussac, Tabl. Syst. 11.

Glandina truncata, Say, Amer. Conch. II, pl. xx (1831); ed. Binney, p. 34, pl. xx; ed. Chenu (Bib. Conch.), III, 28, pl. vii, f. 2, 2a.—Pfeiffer, Mon. Helic. Viv. II, 286.—DeKay, N. Y. Moll. 56 (1843).—Mrs. Gray, Fig. Moll. An. pl. cccl, f. 5 (Ex Bost. Journ.)—Binney, T. M. II, 301, pl. lix, lx.—W. G. Binney, T. M. IV, 141, pl. lxxx, f. 9.—Leidy, T. M. U. S. I. 258, 259, pl. xiv, xvi (1851), anat.—Wyman, B. J. N. H. IV, 416, pl. xxiii (1844), anat.—Tryon, Am. Journ. Conch. II, 225, pl. 1, f. 2 (1866).

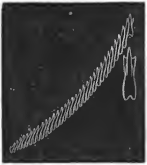
Oleacina truncata, Pfeiffer, Mon. Hel. Viv. IV, 638.—In Brit. Mus. Pulmonata, p. 23.

Planorbis glans, DeKay, l. c. 56.

Atlantic and Gulf States from South Carolina to Texas.

Lingual membrane with 63 long, slender teeth in each chevron-shaped row (32—1—32); centrals straight, pointed, base widened, bifurcated; the other teeth uncinated, thorn-shaped, decreasing in size as they pass off laterally.

Fig. 6.

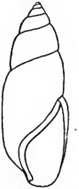


Lingual dentition of *Glandina truncata*.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8397	1	Texas.	W. O. Binney.	......
8398	2	Alabama.	....	......
8399	1	South Carolina.	....	......
8400	1	South Carolina.	Lt. Kurtz.	......
8401	2	Grand Coteau, La.	St. Charles Coll.	......
8402	5	Alabama.	....	......
8403	1	Florida.	....	......
8630	2	St. Simon's Island, Ga.	Dr. J. Lewis.	......
8650	1	Alabama.	....	......
8651		Texas.	Lieut. Couch.	......
8793	2	Indian Key, Fla.	G. Wurdemann.	......
8794	2			
8795	1			

Glandina parallela.—Shell heavy, shining, white, elongated, cylindrical; spire elevated, obtuse; whirls six to seven, with numerous, delicate, longitudinal striæ, the upper ones convex, the last one with straight parallel sides; lip straight along the middle, and parallel to the rectilinear side of the opposite whirl, at the basal extremity curved; columella straight, truncated, covered with a heavy callus. Length 56, breadth 20 millimetres.

Fig. 7.



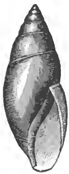
Glandina parallela.

Glandina truncata, var., Binney, T. M. pl. lxii, f. 3.
Glandina parallela, W. G. Binney, Phila. Proc. 1857, 189; T. M. IV, 140.—Tryon, Am. Journ. Conch. II, 226, pl. i, f. 3 (1866).
Oleacina parallela, Pfeiffer, Malak. Blätt. 1859, 51.

From Louisiana through Texas. Probably a variety of *G. truncata*.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8404	3	Texas.	Lieut. Couch.	......
8649	5	Matamoras.	Lieut. Couch.	......

Fig. 8.



Glandina decussata.

Glandina decussata, Deshayes.—Shell oblong-conic, thin, shining, horn-color; whirls seven to eight, longitudinally striate, and covered with numerous minute revolving lines; suture slightly crenulated; aperture oblong, half as long as the shell; columella curved, truncated, covered with light callus. Length 50, diameter 18 millimetres.

Achatina decussata, Deshayes in Fér. (*vide* Pfeiffer, Mon. IV, 644).

Glandina truncata, var., Binney, T. M. II, 302, pl. lxi, f. 1.

Glandina corneola, W. G. Binney, Proc. Phila. Acad. 1857, 189; T. M. IV, 139.

Glandina decussata, Tryon, Am. Journ. Conch. II, 227, pl. i, f. 7 (1866).

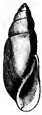
Oleacina corneola, Pfeiffer, Mal. Blatt. 1859, 51.

Western Texas; Mexico.

Cat. No	No. of Sp.	Locality.	From whom received.	Remarks.
8738	1	Devil's River, Tex.	Mex. Bound. Surv.	......

Glandina albersi, Pfeiffer.—Shell ovate-oblong, thin, with crowded longitudinal striæ, pellucid, light flesh-colored; spire moderate, conical, obtuse; suture simple; whirls five and one-half to six, rather convex, more distinctly striated near the suture, the last somewhat longer than the spire, attenuated towards the base; columella straight, abruptly truncated; aperture subvertical, wavy-semioval; peristome simple, acute, its right extremity slightly arcuate. Length 30, breadth 12; of aperture 17 long, 5 mill. broad.

Fig. 9.



Glandina albersi.

Achatina albersi (*Glandina*), Pfeiffer, Proc. Zool. Soc. 1854, 295.

Glandina albersi, Carpenter, Maz. Cat. 175 (1850).—Tryon, Am. Journ. Conch. II, 227, pl. i, f. 9 (1866).

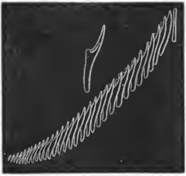
Oleacina albersi, Pfeiffer, Mon. Hel. IV, 640.

California.

Fig. 9 is drawn from an authentic specimen in Mr. Cuming's collection.

Lingual membrane with 50 chevron-shaped rows of 65 slender teeth (32—1—32); central long, narrow, simple; others uncinated, thorn-shaped, greatly modified in size as they pass off laterally.

Fig. 10.



Lingual dentition of *G. albersi*.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
9327	4	Colima, Sierra Madre.	Xantus.	……

Glandina turris, Pfeiffer.—Shell oblong-turreted, closely and lightly costulate-striate, rather thin, diaphanous, flesh-colored; suture margined; whirls seven, very slightly convex, the last less than three-sevenths the length; columella vertical, not reaching the base, abruptly truncated; aperture semioval, subdilated below. Length 43, breadth 15; of aperture, length 19, breadth 8 mill.

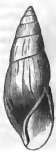
Achatina turris (*Glandina*), Pfeiffer, Symb. III, 91; Mon. II, 285; Brit. Mus. Pulm. 25.—Reeve, Con. Icon. 45.—Not of Deshayes.

Glandina albersi, var. *turrita*, Carpenter, Cat. Prov.

Glandina turris, Carpenter, Maz. Cat. 175 (1856).—Tryon, Am. Journ. Conch. II, 227, pl. i, f. 8 (1866).

Mazatlan.

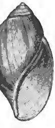
Fig. 11.



Glandina turris.

Glandina bullata, Gould.—Shell elongate ovate, ventricose, widest a little behind the middle, very light and thin, and so translucent as to show the whole of the pillar by transmitted light, very pale horn-color, tinged with rusty brown towards the aperture, shining, and marked longitudinally with fine, rounded striæ; whirls five, tumid, the last composing about seven-eighths of the shell; suture delicate, not strongly impressed; aperture two-thirds the length of the shell, narrow lunate, somewhat dilated by the moderate arching of the pillar margin, the lower third of which takes the direction of the axis; pillar margin covered by a delicate lamina of white callus. Length of axis 37, breadth 20 mill.

Fig. 12.



Glandina bullata.

Glandina bullata, Gould, Pr. Bost. S. N. H. III, 64 (1848); T. M. II, 298, pl. lxii, a.—W. G. Binney, T. M. IV, 139.—Tryon, Am. Journ. Conch. II, 226, pl. I, f. 5 (1866).

Achatina bullata, Pfeiffer, Mon. Hel. III, 512.

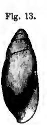
Oleacina bullata, Pfeiffer, Brit. Mus. Cat. 24.

Near New Orleans, and in St. Laundry Parish, Louisiana.

Cat No	No. of Sp.	Locality.	From whom received.	Remarks.
8606	2	Grand Coteau, La.	St. Charles College.	......

Glandina texasiana, Pfeiffer.—Shell oblong, rather solid, with crowded longitudinal striæ, shining pellucid, flesh colored; spire convex-conic, obtuse; suture pale, minutely denticulated; whirls rather convex, the last rather longer than the spire, somewhat attenuated at the base; columella quite arched, forming at its base a white, twisted, abruptly truncated lamina; aperture scarcely oblique, acutely-oval; peristome simple, obtuse. Length 29, diameter 10½; length of aperture 16, breadth 5½ mill.

Fig. 13.



Glandina texasiana.

Glandina truncata, var., Binney, T. M. pl. lxi, f. 2. ?

Achatina texasiana, Pfeiffer, Novit. Conch. 8, p. 82, pl. xxii, f. 11, 12 (1857); Proc. Zool. Soc. 1856.

Glandina texasiana, W. G. Binney, T. M. IV, 140, pl. lxxvii, f. 21. ?—Tryon, Am. Journ. Conch. II, 226, pl. I, f. 4 (1866).

Oleacina texasiana, Pfeiffer, Mon. Hel. IV, 641.

Texas.

Fig. 13 is a fac-simile of one of Pfeiffer's figures.

SPURIOUS SPECIES OF GLANDINA.

Glandina marminii, **DESHAYES**, is referred doubtfully to North America in **BECK's** ind. 78.

SPURIOUS SPECIES OF VERMIVORA.

Testacella ——. (HITCHCOCK's Geol. Rep. Mass 1835, 27.) It is impossible to say what is referred to; certainly not a *Testacella*, as that genus is not found native to North America.

Testacella haliotoidea. A single specimen found in a greenhouse in Nova Scotia. Probably imported on plants.

Sect. 2. **PHYLLOVORA.** The buccal mass small, ovoid, not produced. Jaw distinct, horny, except in *Cylindrellidæ*; teeth on numerous, four-sided plates, close together on the lingual membrane. Mostly herbivorous.

* *Mantle (either discal or spiral) defined, on the middle of the back. Pulmonary cavity under the mantle, and attached to it. Head without any lateral grooves.*

FAMILY CYLINDRELLIDÆ.

Lingual membrane very long and narrow; teeth arranged *en chevron*, joined two by two at their bases.

Jaw wanting.

Body short, stout, spiral, protected by a well-developed shell. Head with a simple, non-projectile buccal sack. Eyes at the ends of moderate peduncles; tentacles stout, quite small. Mantle thin, covered with a shell capable of containing the whole animal; respiratory orifice at the right side beneath the margin of the shell. Foot short, broad, without a distinct locomotive disk, simple posteriorly. Vent near the respiratory orifice. Orifice of the reproductive organs —?

Shell spiral, cylindrical, or turreted, white or variegated, outer lip thickened; aperture circular.

CYLINDRELLA, PFR.

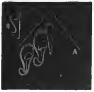
Shell cylindrical or pupæform, multispiral, generally truncated; with remarkable differences in the form of the axis, often furnished with revolving laminæ or other curious processes;

aperture subcircular, edentulate; peristome expanded, continuous.

No jaw.

Teeth of the lingual ribbon joined at the base two by two, and placed in chevron-like rows, inclining obliquely to the centre of the ribbon.

Fig. 14.



Lingual[1] dentition of *Cylindrella scæva*.

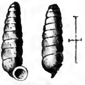
SUBGENUS **GONGYLOSTOMA**, Albers.

Shell cylindrically-fusiform or conic-turreted, apex attenuated, costellately-striate; whirls 9–20, the last more or less protracted, terete, sometimes obsoletely angulated; aperture circular, peristome expanded in every part.

Animal small and short compared with the shell, in general like that of *Helix;* eye-peduncles of medium length, the tentacles quite short. Motions sluggish; the shell drags horizontally, nearly in the line of motion.

Cylindrella poeyana, D'ORBIGNY.—Shell very long, thin, horn-colored or whitish, longitudinally strongly striated; spire very long, inflated, acuminate behind, truncated; whirls eleven, rather convex, the last carinated before; aperture round; peristome acute and continuous, in contact with the preceding whirl. Axis simple. Length 15, breadth 4 mill.

Fig. 15.



Cylindrella poeyana.

Pupa poeyana, D'ORBIGNY, Moll. Cuba, I, 185, pl. xii, f. 24–26.

Cylindrella poeyana, PFEIFFER, Mon. Hel. Viv. II, 380.—CHEMNITZ, ed. 2, 20, pl. iii, f. 29–31.—W. G. BINNEY, T. M. IV, 149.

Cylindrella lactaria, GOULD in T. M. pl. lxix, f. 2, not in text.

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[1] Not being able to obtain the animal of any North American species, I have figured the lingual membrane of *C. scæva*, Gundl., from Cuba, kindly furnished me by Mr. Bland. There are no less than 130 chevron-like rows of 53 teeth each (26—1—26); the central very small, obtusely pointed, laterals uncinated, thorn-like, joined two by two; the upper edge of the plates are fringed.

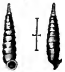
Florida and Cuba.

The description in the Terrestrial Mollusks is drawn from the *lactaria*, Gould, which is identical with *variegata*, Pfr., and is characterized by flexuose milk-white lines and more delicate striæ.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8698	5	Florida.	W. G. Binney.	Cab. series.

Cylindrella jejuna, Gould.—Shell rather small, fusiform, truncated at apex, quite solid, of a pale horn-color, longitudinally striped with delicate, white lines; spire composed of about nine whirls, though when entire the whole number would be about twice as many; they are convex, and separated by a well-marked suture; the last whirl has a delicate carina, and extends in a short neck; the aperture is bell-shaped, the peristome white, continuous, and not in contact with the preceding whirl. Axis simple. Length 10, breadth about 2½ mill.

Fig. 16.



Cylindrella jejuna.

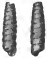
Cylindrella jejuna, Gould, Proc. Bost. Soc. Nat. Hist. III, 41, June, 1848; Terr. Moll. II, 310, pl. lxix, f. 3.—W. G. Binney, T. M. IV, 150.

Cylindrella variegata, Pfeiffer, part, Mal. Blatt. II, 13.

Found abundantly in Florida.

Cylindrella irregularis, Gabb.—Shell about an inch long, slender; spire irregularly tapering, the first three whirls being of the same diameter, the next five to seven whirls increasing steadily, after which the remainder are nearly of the same diameter; apex not always exactly in the apex of the shell; whirls sixteen to eighteen, rounded on the side, body-whirl slightly subangulated below; suture impressed; umbilicus minutely perforate, and bordered by a slight angle; aperture irregular in outline, angulated internally, above and below; outer lip but slightly expanded; inner lip curved internally, and expanded so as to hide the umbilical region in part, most expanded in the middle, and in some specimens distinctly subangulated at this point. Surface sculptured by small longitudinal, slightly arched ribs; color light horn brown. (*Gabb.*)

Fig. 17.



Cylindrella irregularis.

Cylindrella irregularis, Gabb, Am. Journ. Conch. III, 238, pl. xvi, f. 4 (1867).

High table-lands of the interior of Lower California (*Gabb*).

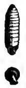
The specimen figured is one of the original lot found by Mr. Gabb.

SUBGENUS **HALOSPIRA**, Mart. & Alb.

Shell rimate, turreted or fusiform, apex conical, not truncated; whirls 11–14, the last not at all or but slightly protracted, carinated at base; columella plicate; aperture quadrangular, peristome free, expanded.

Cylindrella roemeri, PFR.—Shell scarcely rimate, subcylindrical, with an obtusely-conic non-truncated spire, substriate, light flesh-colored; whirls fourteen, narrow, rather flattened, the last carinated at base, separated from the shell and twisted; aperture vertical, oblong, circular, within narrowed by a fold on its right margin; peristome continuous, equally and briefly expanded. Length 13–14, diam. 4½ mill.; ap. 3 mill. long, 2½ broad.

Fig. 18.



C. roemeri.

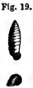
β. Smaller, more ventricose above; whirls twelve, the last more briefly loosened. Length 11, diam. above the middle 4 mill.

Cylindrella roemeri, PFEIFFER, Mon. Hel. Viv. II, 383; in ROEMER'S Texas, 456; in CHEMN. ed. 2, no. 81, pl. vii, f. 4–6.—W. G. BINNEY, T. M. IV, 150.

New Braunfels, Texas.

Cylindrella goldfussi, MENKE.—Shell umbilicated, elongated, more ventricose at the middle, apex conic, not truncated, thin, diaphanous, light horn-color, marked with numerous light, subarcuate striæ; whirls twelve, scarcely convex, narrow, the last slightly extended beyond the body of the shell, carinated, its right side somewhat furrowed, rounded at base; aperture subvertical, obliquely and subtriangularly pear-shaped; peristome slightly expanded at its entire circumference, its right termination flexuose. Axis with revolving lamella, and also with a curious one on the under side of the septum of the third whirl from the base. Length 11, diameter 4½ mill.

Fig. 19.



C. goldfussi.

Cylindrella goldfussi, MENKE, in Zeitsch. f. Mal. 1847, III, 2. —PFEIFFER, Mon. Hel. Viv. II, 383.—PHILLIPPI, Icon. III, 6, tab. iii, 9 (1847).—W. G. BINNEY, T. M. IV, 151, pl. lxxix, f. 33.

Texas, on the Blanco.

In the penultimate whirl of *C. goldfussi* there are four lamellæ:

one strongly developed, situated on the under side of the upper septum, and in length about equal to one-half of the circumference of the whirl; another on the upper surface of the lower septum, immediately beneath and opposite to the above-mentioned lamella, and of about equal length, but not so much developed; a third lamella on the middle of the lower half of, and revolving on the axis; the fourth on the inner side of the outer wall of the shell (opposite the axial lamella), and visible from the exterior. (*Bland.*)

Cat No.	No. of Sp.	Locality.	From whom received.	Remarks.
8419	8	Banks of the Blanco.	Dr. B. F. Shumard.	……
8603	3	" " "	"	Cab. series.

SPURIOUS SPECIES OF CYLINDRELLA.

Cylindrella pontifica, GOULD, is *Macroceramus kieneri*, PFR.

FAMILY HELICIDÆ.

Lingual membrane with numerous similar, transverse rows of teeth.

Jaw smooth, striated or ribbed, with or without a central projection on its concave margin, single, or composed of numerous separate plates.

Body elongate, attached its whole length to the upper surface of the foot, or more or less spiral and prominent on the middle of the upper surface of the foot. Eyes at the end of long, cylindrical, retractile peduncles; tentacles shorter, retractile, sometimes wanting. Mantle thin, small, discal or spiral, on the middle of the back; respiratory orifice subcentral, on the right side. Foot narrow, elongate, without a distinct locomotive disk, simple posteriorly. Vent near the respiratory orifice, central. Orifice of reproductive organs usually below the respiratory orifice or behind the right eye-peduncle.

Shell very variable in form, sometimes rudimentary and internal.

SUBFAMILY VITRININÆ.

Jaw smooth, usually neither striated nor ridged, with a blunt middle projection.

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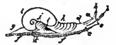
The middle tooth of the lingual ribbon short, tricuspid; laterals of the same shape, but bicuspid; uncini thorn-shaped, curved.

VITRINA, Drap.

Shell imperforate, pellucid, glassy, depressed; spire short; whirls 2–3, rapidly increasing, the last dilated; aperture ample, peristome thin, often membranous.

Fig. 20.



Animal of *Vitrina.*[1]

Animal: body elongated, limaciform; mantle covering the back and neck, and extending to the base of the eye-peduncles, with one or more processes or prolongations of its margin, which are reflected upon the shell; tentacles very short. Respiratory orifice in the mantle, behind its usual position in the *Limaces.* Generative orifice behind and below the eye-peduncle.

Fig. 21.

Jaw of *Vitrina.*[1]

Jaw arcuate, concave margin with a median, beak-like projection.

Lingual membrane with long slender teeth; centrals tricuspid, laterals bicuspid, in straight transverse series; uncini long, curved, thorn-shaped, bidentate, in a curved transverse series, and diminishing in size as they pass off laterally.

Fig. 22.

Lingual dentition of *V. limpida.* [Morse.]

Vitrina limpida, Gould.—Shell globose-discoid, thin, fragile, transparent, shining; whirls two and a half to three, scarcely convex, with very minute lines of increase, the last whirl large, and much expanded;

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[1] *V. major* from Moquin-Tandon.

suture not much impressed, sometimes with an impressed line revolving near it; aperture large, subovate, somewhat diminished by the intrusion of the penultimate whorl; peristome thin and acute, the columellar margin a little reflected; axis imperforate. Greatest transverse diameter nearly 6 mill.

Fig. 23.

Vitrina limpida.

Vitrina pellucida, DeKay, N. Y. Moll. 25, pl. iii, f. 42 (1843), not of Müller.—Adams, Sh. of Vt. 162.—Binney, T. M. II, 58, pl. lxvii, a, f. 1.

Vitrina americana, Pfeiffer, Dec. 1852, Proc. Zool. Soc. 156.—Chemnitz, ed. 2, 9, pl. i, f. 22–25 (1854).

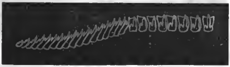
Vitrina limpida, Gould, in Agassiz' Lake Superior, p. 243, 1850; Terr. Moll, *l. c.*—Pfeiffer, Malac. Blatt. II, 10 (1856); Mon. Hel. Viv. IV, 798.—W. G. Binney, T. M. 33.—Reeve, Con. Icon. 62.—Morse, Journ. Portl. Soc. i, 11, pl. v, f. 17 (1864); in Amer. Nat. I, 314, f. 20 (1867).—Tryon, Am. Journ. Conch. II, 243, pl. iii, f. 1 (1866).

Found in Maine, Vermont, New Brunswick, and to the northwest of Lake Superior. An accidentally introduced colony has lately been found by Dr. Lewis, at Mohawk, N. Y.

Animal whitish, grayish, or blackish, large compared with the shell. Head, eye-peduncles, and eyes black; tentacles very short. The prolongation of the mantle extends from under the shell, over the back and neck to the base of the eye-peduncles, but is unattached and free; from the right side of the mantle posteriorly, there arises a tongue-shaped process, which is reflected back upon the shell, and reaches to the spire. Respiratory foramen in the posterior part of the mantle.

Lingual membrane with 90 rows of long, slender teeth, fifty-one teeth in each row (25—1—25); centrals tricuspid; laterals bicuspid, in straight transverse rows; laterals thorn-shaped, somewhat curved, with two acute points, in curving transverse rows, becoming smaller as they pass off laterally.

Fig. 24.



Lingual dentition of *V. limpida*. [Morse.]

Cat. No.	No. of Sp	Locality.	From whom received.	Remarks.
8832	4	Portland, Me.	T. Bland.	……

Vitrina angelicæ, Beck.—Shell convexly depressed, smooth, polished, pellucid, greenish-yellow; spire short, subprominent; suture delicately crenulated; whirls three and one-half, rapidly increasing, the last broad below; aperture oblique, lunate-oval; peristome simple, subinflected, its columellar margin not receding and slightly arched. Greatest diam. 6, lesser 4⅔; height 3½ mill.

Fig. 25.

Vitrina angelicæ, enlarged.

Vitrina angelicæ, Beck, Ind. 1.—Möller, Ind. Moll. Gr. 4 (1842).—Pfeiffer, Mon. Hel. Viv. II, 510.—Mörch, Nat. Bidr. v. Gr. 76.—W. G. Binney, T. M. U. S. IV, 32, pl. lxxix, f. 9.—Reeve, Con. Icon. 45.—Tryon, Am. Journ. Conch. II, 243, pl. ii, f. 2 (1866).

Helix pellucida, Fabricius, Fauna Gr. 389, excl. syn. Müller (1780).

Helix domestica, Ström.[1] Der Tronh. Vidensk. III. 435, pl. vi, f. 15.

Greenland.

Vitrina pfeifferi, Newcomb.—Shell moderately depressed, smooth, shining, pellucid, greenish-white; whirls three, the last composing most of the shell; suture very finely margined; aperture large, obliquely and roundedly ovate; lip thin, columella arched. Diam. 5, axis 2 mill. (*Newcomb.*)

Fig. 26.

Vitrina pfeifferi, enlarged.

Vitrina pfeifferi, Newcomb, Proc. Cal. Acad. Nat. Sci. II, 92 (1861).—Tryon, Am. Journ. Conch. II, 244, pl. iii, f. 3 (1866).

Carson Valley, Nevada to Owen's Valley, California.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
9354	1	Carson Valley.	Dr. J. G. Cooper.	Type figured.

Fossil Species of Vitrina.

Vitrina obliqua, Meek & Hayden, Proc. Phila. Acad. Nat. Sci. 1857, 134.

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[1] This name I give to a little snail, which is represented by fig. 15, since I find nothing in Linné's Systema Nat. to which I can with certainty refer it. It is small, ovate-rounded, and somewhat convex above, and shows three small and flat whirls on the one side. The aperture is large and may be called almost entirely round, and the columella, or part attached to the snail's house, comprises a small segment, or may be inscribed in an exact circle. The shell is yellowish, and so brittle that one cannot pick it up without breaking it in pieces. It contains a bluish snail. It is found in great numbers under the moss or turf on houses, and is sometimes fully as large as the figure, which represents both the upper and lower sides. (*Ström.*)

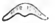
HYALINA, (Fér.) Gray.

Animal as in *Helix*.

Shell generally umbilicated, thin, shining, greenish or reddish horn-color; whirls 5–7, regularly increasing, the last not descending, generally anteriorly dilated; spire depressed, very rarely orbicularly-conic; aperture roundly-lunate; peristome thin, acute, straight.

Jaw simple (neither furrowed nor dentate), arcuate, its lower edge acute, with a rostriform projection in the middle.

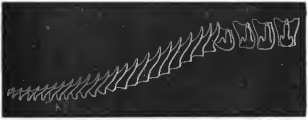
Fig. 27.



Jaw of *Hyalina fulva*.

Lingual membrane with central tricuspid teeth, a few bicuspid laterals in a straight row, and numerous thorn-shaped, curved uncini in a curving transverse series, modified greatly in size as they pass off laterally.

Fig. 28.



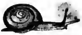
Lingual dentition of *Hyalina viridula*.

Subgenus HYALINA, s. str.

Shell umbilicated, sometimes perforated, depressed, glassy, shining; whirls 5–6, regularly increasing; spire very rarely elevated-conic; aperture roundly lunate; peristome thin, acute, straight.

Animal with long, slender eye-peduncles and short tentacles; orifice of respiration on the right side under the edge of peristome; orifice of generation on the right side of the head.

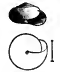
Fig. 29.



Animal of *H. cellaria*.

Body elongated, semi-cylindrical, tapering to a point posteriorly, convex above, plane beneath, the whole area forming a locomotive disk; integument reticulated by furrows surrounding numerous longitudinal mucus glands; mantle simple, not extending beyond, and accurately fitting to, the peristome of the shell, into which the whole animal may retire; head obtuse, without a constricted neck.

Fig. 30.



Hyalina cerinoidea.

Hyalina cerinoidea, ANTHONY.—Shell perforated, globosely flattened, shining, light horn color, scarcely wrinkled by lines of growth; whirls seven, hardly convex, the last slightly inflated below; aperture oblique, subcircular; peristome simple, acute, its ends joined by a light callus. Greater diam. 7, lesser 6; height 3 mill.

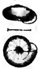
Helix cerinoidea, ANTHONY, Am. Journ. Conch. I, 251, pl. xxv, f. 4 (Oct. 1865).

Mesomphix cerinoidea, TRYON, Am. Journ. Conch. II, 255, pl. iv, f. 36 (1866).

North Carolina.

The specimen figured was loaned by Mr. Anthony.

Fig. 31.



Hyalina cellaria.

Hyalina cellaria, MÜLLER.—Shell very much depressed, thin, fragile, pellucid; epidermis light greenish horn-color, smooth, highly polished; whirls five, slightly rounded, with minute and almost imperceptible, oblique striæ; aperture not dilated, its transverse diameter the greatest; umbilicus moderate, regularly rounded, deep; base rounded, thickened within by a testaceous deposit, bluish-white; peristome simple, acute. Greater diam. 13, lesser 11½; height 5 mill.

Helix cellaria, MÜLLER, Hist. Verm. II, 28.—PFEIFFER, Mon. I, 111.—BINNEY, Bost. Journ. III, 421; Terr. Moll. II, 230, pl. xxix, f. 4.—GOULD, Inv. 180, f. 104, excl. syn. ? (1841).—DEKAY, N. Y. Moll. 37, pl. iii, f. 35 (1843).—LEIDY in Terr. Moll. U. S. I, 233, pl. vii, f. 1 (1851), anat.—W. G. BINNEY, Terr. Moll. IV, 111.

Hyalina cellaria, MORSE, Journ. Portl. Soc. I, 12, f. 18, 19, pl. v, f. 20 (1864).—TRYON, Am. Journ. Conch. II, 249, pl. iii, f. 19 (1866).—MORSE in Amer. Nat. I, 541, f. 29 (1867).

Helix glaphyra, SAY, Nich. Encycl. Am. ed. pl. i, f. 3; BINNEY's ed. 7, pl. lxix, f. 3.—EATON, Zool. Text-Book, 194.—BLAND, N. Y. Lyc. Ann. VI, 352, not of PFEIFFER, REEVE, DESHAYES.

An European species introduced by commerce into some of the Atlantic ports. It is common in damp cellars in Boston, and has been noticed during the last year (1862) in Providence, Salem, Lynn, Marblehead, Portland, Halifax Linsley includes it in his List of Connecticut Shells. In 1864 it was found at Astoria, Long Island, New York.

The synonymy of the species is discussed in full by Mr. Bland and myself (*l. c.*). A fac-simile of Say's figure of *H. glaphyra* is here given.

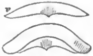
Fig. 32.

Helix glaphyra.

Animal (see p. 29): Upper surface light indigo blue, darkest on the head, neck, and eye-peduncles, collar greenish, eyes black; foot narrow and slender, not much exceeding in length the diameter of the shell, terminating acutely.

Jaw strongly arcuate, ends bluntly rounded; centre of anterior surface slightly striate; concave margin smooth, with a median projection.

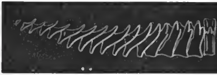
Fig. 33.



Jaw of young and old *Hyalina cellaria.* [Morse.]

Lingual membrane with 38 curving rows of 17—1—17 teeth each; centrals long, with three short-obtuse cusps; laterals four, bicuspid, inner cusp shorter; uncini thorn-shaped, curved, decreasing rapidly in size as they pass off laterally.

Fig. 34.

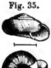


Lingual dentition of *Hyalina cellaria.* [Morse.]

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8035	1	Halifax, N. S.	......	......
8629	3	Boston (Mt. Vernon St.).	W. G. Binney.	Cab. series.
8772	6	" "	W. Stimpson.	......

Hyalina nitida, Müller.—Shell orbicular, depressed, moderately convex above and concave below, thin, shining, uniform brownish horn-color, with delicate striæ of growth; whirls five or more, convex, separated by a deeply impressed suture, the outer one disproportionately large, somewhat declining as it approaches the aperture, and obtusely angular at the periphery, beneath excavated around a broad, crateriform umbilicus, in which the whirls are displayed to the apex; aperture oblique, lunate; peristome simple, its basal margin arcuate. Greater diam. 7½, lesser 6, height 3⅔ mill.

Fig. 35.



Hyalina nitida.

Helix nitida, MÜLLER, Hist. Verm. II, 32, &c.—PFEIFFER, Mon. II, 94.

Helix lucida, DRAPARNAUD, Moll. Fr. 103, pl. viii, f. 11, 12.—BINNEY, Terr. Moll. II, 233, pl. xxii, a, f. 2.—W. G. BINNEY, Terr. Moll. IV, 116.

Helix hydrophila, INGALLS in coll., unpublished.

Hyalina nitida, TRYON, Am. Journ. Conch. II, 250, pl. iv, f. 24 (1866).

Fig. 36.

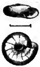
Hyalina nitida. [MOQ.-TAND.]

An European species, found at Great Slave Lake, Fort Resolution in British America, and in New York and Ohio. Fig. 36, copied from Moquin-Tandon, represents a specimen from France.

Cat No.	No. of Sp.	Locality.	From whom received.	Remarks.
8679	8	Greenwich, Washington [Co., N. Y.	W. G. Binney.	=*hydrophila*, Ingalls. Cab. series.
9276	10	Peace River.	R. Kennicott.	......
9076	2	British America.	"	......

Hyalina whitneyi, NEWCOMB.—Shell umbilicated, greatly depressed, thin, smooth, scarcely marked by the delicate wrinkles, shining, smoky horn-color; spire slightly elevated; whirls four, flattened, the last planulate above and below; umbilicus broad, pervious; aperture transversely subcircular; peristome acute, simple. Greater diam. 5½, lesser 4½; height 2 mill.

Fig. 37.



Hyalina whitneyi.

Helix whitneyi, NEWCOMB, Proc. Cal. Acad. Nat. Sci. III, 118 (1864).

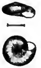
Patula whitneyi, TRYON, Am. Journ. Conch. II, 263 (1866).

In the Sierra Nevada, near Lake Tahoe, California, under damp logs and bark.

Cat. No	No. of Sp	Locality.	From whom received	Remarks.
8352		....	Dr. J. G. Cooper.	Type figured.

Hyalina arborea, Say.—Shell umbilicated, depressed, very slightly convex, thin, pellucid; epidermis amber-colored, smooth, shining; whirls four to five, with very minute, oblique striæ, apparent when viewed with the microscope; aperture transversely rounded; peristome thin, acute; umbilical region indented; umbilicus moderate, well developed, round, and deep. Greater diam. 5, lesser 4½: height 2⅔ milli.

Fig. 38.



Hyalina arborea.

Helix arborea, Say, Nich. Encyc. pl. iv, f. 4; Binney's ed. 5, pl., lxxii, f. 5 (1817, 1818, 1819).—Eaton, Zool. Text-Book, 193 (1826).—Binney, Bost. Journ. Nat. Hist. III, 422, pl. xxii, f. 1 (1840); Terr. Moll. II, 235, pl. xxix, f. 3.—DeKay, N. Y. Moll. 30, pl. ii, f. 10 (1843).—Gould, Invertebrata, 182, f. 110 (1841).—Adams, Vermont Mollusca, 160 (1842).—Pfeiffer, Mon. Hel. Viv. I, 95.—Chemnitz, 2d ed. II, 114, tab. lxxxv, f. 33–35.—Reeve, Con. Icon. 733.—W. G. Binney, Terr. Moll. IV, 116.—Morse, Amer. Nat. I, 542, f. 30 (1867).

Helix ottonis, Pfeiffer, olim, Weigm. Arch. 1840, I, 251.—Binney, Terr. Moll. II, 238, pl. xxix, a, f. 3.—W. G. Binney, T. M. IV, 117.

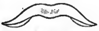
Hyalina arborea, Morse, Journ. Portl. Soc. I, 14, f. 28, pl. vi, f. 29 (1864).—Tryon, Am. Journ. Conch. II, 251, pl. iii, f. 17 (1866).

Hyalina ottonis, Tryon, Am. Journ. Conch. II, 251, pl. iv, f. 26 (1866).

From Labrador to Texas and on the Rio Chama in New Mexico; from Florida to Great Slave Lake; also in Washoe Co., Nevada; in Montana and California. It is also said to be found in Cuba; also in Guadeloupe.

Jaw arcuate, narrow, with curving, pointed ends; anterior surface with a few striæ; concave margin smooth, with a wide median projection; convex margin with a corresponding depression.

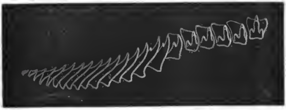
Fig. 39.



Jaw of *Hyalina arborea*. [Morse.]

Lingual membrane with 82 rows of 21—1—21 teeth of the

Fig. 40.



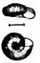
Lingual dentition of *Hyalina arborea*. [Morse.]

same character as the other species of the subgenus described above; the two inner laterals with a small lateral denticle.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
7932	39	Mohawk, N. Y.	Dr. J. Lewis.	"*H. hydrophila*," J. L.
7952	21	Milwaukee, Wis.	I. A. Lapham.	......
7953	10	Mohawk, N. Y.	Dr. J. Lewis.	......
7954	4	Big Sioux.	......	"*H. lucida*," teste Lea.
8003	22	Kansas.	......	......
8004	3	Minnesota.	I. A. Lapham.	......
8005	17	Marietta, O.	W. Holden.	......
7971	13	Kansas.	......	Dupl.
8611	13	Georgia.	Dr. J. Lewis.	Cab. series.
8778	1	Canso, Labrador.	W. Stimpson.	......
8780	4	Massachusetts.	"	......
9082	2	English River.	R. Kennicott.	......

Hyalina viridula, Menke.—Shell umbilicated, small, depressed, thin, fragile; epidermis pale, or brownish horn-color, wrinkled, shining; whorls four, the last rapidly enlarging towards the aperture; aperture transversely rounded; peristome simple, its edge rather thickened, not acute; umbilicus small, but well marked and constant. Greater diam. 5, lesser 4⅔; height 2 mill.

Fig. 41.



Hyalina viridula.

Helix electrina, Gould, Invert. 183, f. 111 (1841).—Binney, Bost. Journ. Nat. Hist. III, 423, pl. xxii, f. 2 (1840); T. M. II, 286, pl. xxix, f. 1.—DeKay, N. Y. Moll. 30 (1843).—Adams, Vermont Mollusca, 161 (1842).—W. G. Binney, Terr. Moll. IV, 107.—Morse, Amer. Nat. I, 542, f. 31 (1867).

Helix pura, Alder, teste Pfeiffer, Mon. Hel. IV, 83.

Helix janus, Adams MS. (olim), Sholis Vt. Am. J. Sc. [1], XL, 273 (1841).

Zonites radiatulus, Reeve, Br. Land and Fr.-W. Sh. 50, fig. (1863).

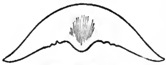
Zonites striatula, Moquin-Tandon, Moll. Fr. teste Reeve.

Helix viridula, Menke, Syn. Meth. ed. 2, 127; see also Mal. Blatt. VIII, 92.

Hyalina electrina, Morse, Journ. Portl. Soc. I, 13, f. 23, pl. vi, f. 24 (1864).—Tryon, Am. Journ. Conch. II, 251, pl. iv, f. 25 (1866).

From Great Slave Lake to the Gulf of Mexico. Also in Europe.

Fig. 42.

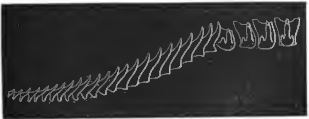


Jaw of *Hyalina viridula*. [Morse.]

Jaw arcuate, ends attenuated, pointed; anterior surfaces centrally somewhat striate; concave margin smooth, with a median rounded projection, on each side of which are two notches.

Lingual membrane with 54 rows of 27—1—27 teeth, arranged

Fig. 43.



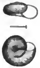
Lingual dentition of *Hyalina viridula*. [Morse.]

and of the same form as the species of the subgenus already described.

Cat. No	No. of Sp.	Locality.	From whom received.	Remarks.
7953	4	Kansas.	......	Among river-bank {rubbish.
7963	56	Mohawk, N. Y.	Dr. J. Lewis.	......
8667	10	Massachusetts.	W. Stimpson.	Cab. series.
9060	1	British America.	R. Kennicott.	......

Hyalina indentata, Say.—Shell subperforated, flattened, thin, pellucid; epidermis highly polished, corneous; whirls rather more than four, rapidly enlarging, with regular, sub-equidistant, radiating, impressed lines, which on the body-whirl extend to the centre of the base, outer whirl expanding towards the aperture; suture well impressed; aperture rather large, transverse; peristome simple, acute, very thin, at its inferior extremity terminating at the centre of the base of the shell; umbilicus none, but the umbilical region is indented. Greater diam. 5, lesser 4⅓; height 2½ mill.

Fig. 44.



Hyalina indentata.

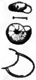
Helix indentata, Say, Journ. Acad. II, 372 (1822); Binney's ed. 24.—Binney, Bost. Journ. Nat. Hist. III, 415, pl. xxii, f. 3 (1840); Terr. Moll. II, 242, pl. xxix, f. 2.—DeKay, N. Y. Moll. 31, pl. iii, f. 26 (1843).—Gould, Invert. 181, f. 109 (1841).—Adams, Vermont Mollusca, 160 (1842).—Chemnitz, 2d ed. I, 21, pl. xxxiv, f. 12–15.—Pfeiffer, Mon. Hel. Viv. I, 59.—Reeve, Con. Icon. 730 (1852).—W. G. Binney, T. M. IV, 119.—Morse, Amer. Nat. I, 413, f. 28 (1867).

Hyalina indentata, Morse, Journ. Portl. Soc. I, 12, f. 21, pl. ii, f. 11; pl. v, f. 22 (1864).—Tryon, Am. Journ. Conch. II, 246, pl. iii, f. 11 (1866).

Inhabits all of eastern North America, having been found from Canada to Texas and from Dacotah to Florida. It is also said to occur in St. Domingo.

A variety with an open umbilicus is sometimes found (Fig. 45).

Fig. 45.

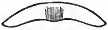


Hyalina indentata, var.

Jaw somewhat arcuate, long, narrow, ends somewhat attenuated, pointed; anterior surface with central longitudinal striæ; concave margin smooth, with a slightly developed, broad median projection.

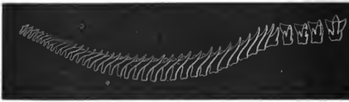
Lingual membrane very broad, with 53 rows of 79 teeth each (39—1—39); centrals tricuspid, the median cusp very large and longer than the plate on which it rests; laterals three only on each side, bicuspid, arranged in a straight transverse row; uncini pointed, curved, thorn-shaped, greatly diminishing in size as they pass off laterally, arranged in a slightly crescent-shaped row on each side of the lingual membrane.

Fig. 46.



Jaw of *Hyalina indentata*. [Morse.]

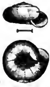
Fig. 47.



Lingual dentition of *Hyalina indentata*. [Morse.]

Cat. No.	No. of Sp	Locality.	From whom received.	Remarks.
7921	42	Columbus, O.	Dr. J. Lewis.	......
7922	5	Cape Elizabeth, Me.	"	......
8395	12	....	W. O. Binney.	Cab. series.
8771	8	Massachusetts.	W. Stimpson.	......
8992	2	Western Texas.	......	......

Fig. 48.



Hyalina limatula.

Hyalina limatula, Ward.—Shell widely umbilicated, small, depressed, thin; epidermis whitish, immaculate; suture distinctly impressed; whirls more than four, convex, with very fine, oblique, parallel striæ, which become obsolete on the base; aperture oblique, subcircular, slightly modified by the penultimate whirl; peristome thin, acute, its ends approaching; umbilicus rounded, large and deep, not exhibiting all the volutions. Greater diam. 5½, lesser 5; height 2¼ mill.

Helix limatula, Ward, MSS. in Binney, Bost. Journ. Nat.

Hist. III, 434, pl. xxi, f. 2 (1840); Terr. Moll. U. S. II, 219, pl. xxx, f. 3.—Pfeiffer, Mon. Hel. Viv. I, 113; IV, 85.—W. G. Binney, T. M. IV, 100.

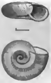
Pseudohyalina limatula, Tryon, Am. Journ. Conch. II, 264, pl. iv, f. 65 (1866).

From New York to Michigan; also in Indiana.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8680	1	....	W. G. Binney.	Cab. series.
8792	6	....	......	......

Hyalina duranti, Newcomb.—Shell widely umbilicated, depressed, discoidal, of a dead white or greenish color, thin, with very coarse, rough striæ; whirls four, flattened, the last discoidal, not descending at the aperture, below broadly excavated and channelled; suture delicate; aperture removed from the axis, transversely rounded; peristome simple, acute, its terminations approaching, joined by callus, that of the columella not reflected. Greater diam. 4, height 1½ mill.

Fig. 49.



Hyalina duranti.

Helix duranti, Newcomb, Proc. Cal. Acad. Nat. Sci. III, 118 (1864).

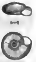
Patula duranti, Tryon, Am. Journ. Conch. II, 263, pl. iv, f. 53 (1866).

Santa Barbara Island, California.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
9347	5	Sta. Barbara Isl., Cal.	Dr. J. G. Cooper.	Type.

Hyalina minuscula, Binney.—Shell umbilicated, minute, depressed-convex; epidermis whitish; whirls four, convex, not increasing rapidly in diameter, with microscopic wrinkles; suture very distinctly impressed; aperture nearly circular; peristome thin, acute; umbilicus large, not spread, deep, and exhibiting the volutions; base rounded, columella with a thin callus. Greater diam. 2½, lesser 2¼; height 1 mill.

Fig. 50.



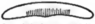
Hyalina minuscula.

Helix minuscula, Binney, Bost. Journ. Nat. Hist. III, 435, pl. xxii, f. 4 (1840); Terr. Moll. II, 221, pl. xvii, a, f. 2, excl. syn.—Adams, Vermont Mollusca, 161 (1842).—Chemnitz, 2d ed. II, 112, tab. lxxxv, f. 20–23.—Pfeiffer, Symbol. II, 33; Mon. I, 114.—Reeve, Con. Icon. 731 (1852).—W. G. Binney, T. M. IV, 102.—Morse, Amer. Nat. I, 543, f. 35 (1867).

Helix minutalis, Morelet, nec. Fer. Test. Nov. II, 7.
Helix apex, Adams, Contr. Conch. 36.—Reeve, *l. c.* 339.
Helix lavelleana, D'Orbigny, Moll. Cub. in text, 161, excl. pl. (1853).
Helix mauriniana, D'Orbigny, *l. c.* in pl. viii, f. 20–22, excl. text.
Pseudohyalina minuscula, Morse, Journ. Portl. Soc. I, 16, f. 34, pl. vii, f. 35 (1864).—Tryon, Am. Journ. Conch. II, 264, pl. iv, f. 62 (1866).

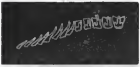
From the Red River of the North to Texas and Florida. It may thus be said to inhabit all eastern North America; has lately been found in California, and is quoted from Bermuda, Cuba, Jamaica, and Porto Rico.

Fig. 51.



Jaw of *Hyalina minuscula*. [Morse.]

Fig. 52.



Lingual dentition of *Hyalina minuscula*. [Morse.]

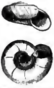
Jaw long, narrow, but slightly arcuate, of almost uniform width, ends rounded; anterior surface with central longitudinal striæ; concave margin smooth, with a slightly developed, broad, median projection.

Lingual membrane with 52 curving rows of 12—1—12 teeth each; centrals tricuspid, laterals bicuspid; uncini curved, acute.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8681	3	....	J. O. Anthony.	Cab. series.

Hyalina milium, Morse.—Shell widely umbilicated, depressed, transparent, shining, white, with a greenish tinge, marked with distinct and regular striæ of growth and microscopic revolving lines, the latter more conspicuous below; spire but slightly elevated; whirls three, rounded, rapidly increasing, the last planulate above, widely umbilicated below; aperture very oblique, subcircular, remote from the axis; peristome simple, acute, its terminations somewhat approached, that of the columella not reflected. Greater diam. 1½; height ½ mill.

Fig. 53.



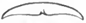
Hyalina milium, enlarged.

Helix milium, Morse, Proc. Bost. Soc. VII, 28 (1859).—W. G. Binney, Terr. Moll. IV, 101, pl. lxxix, f. 4–5.—Morse, Amer. Nat. I, 543, f. 36 (1867).
Striatura milium, Morse, Journ. Portl. Soc. I, 18, f. 41, 42, pl. vii, f. 43 (1864).
Pseudohyalina milium, Tryon, Am. Journ. Conch. II, 265, pl. iv, f. 56 (1866).

Massachusetts and Maine. It is quoted doubtfully from California by Cooper.

The surface of the shell is raised in numerous rib-like folds, frequently anastomosing; longitudinal ribs reticulate the surface and render the folds so crenulated that in certain lights the shell appears as if ornamented with strings of beads. This peculiar character disappears at the base of shell, and is replaced by revolving lines and regular lines of accretion.

Fig. 54.

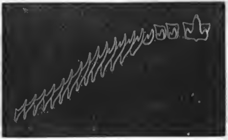


Jaw of *Hyalina milium*. [Morse.]

Jaw long, narrow, scarcely arcuate, ends attenuated, pointed; anterior surface smooth, with two deep, longitudinal channels in its centre; concave margin smooth, somewhat prominent in the middle, broken by the channels.

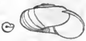
Lingual membrane with 68 arched rows of thirty-five (17—1—17) teeth each; centrals very large, broad, tricuspid; laterals two on a side, bicuspid; uncini thorn-shaped, curved, pointed, greatly diminishing in size as they pass off laterally, the first six with a smaller, lateral point.

Fig. 55.



Lingual dentition of *Hyalina milium*. [Morse.]

Fig. 56.



Hyalina binneyana.

Hyalina binneyana, Morse.[1]—Shell umbilicated, subglobose, transparent, almost colorless, shining, smooth, with microscopic wrinkles of growth and still more delicate oblique wrinkles; spire not much elevated; whirls about four, rounded, gradually enlarging, the last globose, broadly umbilicated below: aperture oblique, subcircular, large; peristome simple, acute, extremities not approaching, that of the columella subreflected. Greatest diam. 4, height 2 mill.

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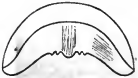
[1] In Am. Journ. Conch. I, 188, Mr. Tryon proposes for this species the name *morsei*, on account of *Helix binneyana*, Pfr. I have retained Morse's name, as it is not preoccupied in the genus *Hyalina*. In his first catalogue of Maine Shells, Mr. Morse uses the name *binneyi*, which can be employed, if necessary, to distinguish the shell from Pfeiffer's.

Hyalina binneyana, Morse, Journ. Portl. N. H. Soc. I, 13, f. 25, 26; pl. ii, f. 9; pl. vi, f. 27 (1864).—Tryon, Am. Journ. Conch. II, 252, pl. iv, f. 31 (1866).

Helix binneyana, Morse, Amer. Nat. I, 542, f. 32 (1867).

Southern part of Maine; Tawas Bay, Mich.

Fig. 57.

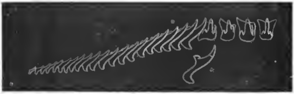


Jaw of *Hyalina binneyana*. [Morse.]

Jaw very broad, arched, ends attenuated, bluntly rounded; anterior surface with some central striæ; concave margin with a small rounded median projection, on either side of which are two smaller projections.

Lingual membrane with 60 rows of 23—1—23 teeth; centrals tricuspid; laterals bicuspid; uncini thorn-shaped.

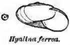
Fig. 58.



Lingual dentition of *Hyalina binneyana*. [Morse.]

Hyalina ferrea, Morse.—Shell umbilicated, depressed-globose, transparent, of a very light steel gray color, not shining, marked with very delicate incremental wrinkles and microscopic revolving lines; spire slightly elevated; whirls three, rounded, the last rapidly enlarging, globose; aperture large, transversely subcircular; peristome simple, acute, its extremities not approaching, that of the columella scarcely subreflected. Greatest diam. 2½, height 1¼ mill.

Fig. 59.



Hyalina ferrea.

Striatura ferrea, Morse, Proc. Portl. S. N. H. I, 17, f. 36–40, and pl. ii, f. 10 (1864).

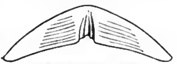
Hyalina ferrea, Tryon, Am. Journ. Conch. II, 253, pl. iv, f. 32 (1866).

Helix ferrea, Morse, Amer. Nat. I, 544, f. 37 (1867).

Digitized by Google

Maine.

Fig. 60.

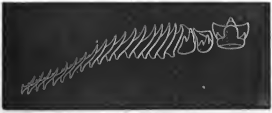


Jaw of *Hyalina ferrea*. [Morse.]

Jaw bent at either end, ends tapering, acute; anterior surface deeply channelled in its centre; concave margin smooth, with a deep, median indentation.

Lingual membrane with 39 curving rows of 20—1—20 teeth; centrals enormously developed, very broad, tricuspid, the middle cusp very broad; two bicuspid laterals on each side, the inner much the smaller; uncini thorn-shaped, similar to those of the other species of the subgenus.

Fig. 61.



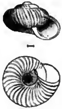
Lingual dentition of *Hyalina ferrea*. [Morse.]

Hyalina conspecta, Bland.—Shell umbilicate, subdepressed, thin, with oblique, rather distant rib-like striæ, the interspaces microscopically striate, dark horn-colored; spire convex, with smooth, obtuse apex; suture deep; whirls four, convex, gradually increasing, the last broader, rounded, slightly descending above; umbilicus about equal to two-sevenths the diameter of the shell; aperture oblique, roundly lunate; peristome simple, straight, the margins approaching, the columellar margin scarcely dilated. Greater diam. 2, lesser $1\frac{3}{4}$; height 1 milli.

Helix conspecta, Bland, Ann. N. Y. Lyc. VIII, 163, f. 7 (Nov. 1865).

Pseudohyalina conspecta, Tryon, Am. Journ. Conch. II, 265, pl. iv, f. 58 (1866).

Fig. 62.



Hyalina conspecta.

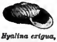
San Francisco and Monterey, Cal.

H. conspecta differs from *Helix asteriscus* in having an elevated spire and a smaller umbilicus. The rib-like striæ are more numerous, but scarcely raised above the surface of the shell, which, under the microscope, is very similar to that of *H. asteriscus.*

Hyalina exigua also has very prominent ribs, but they are independent of the striæ of growth and run obliquely to them.

Hyalina exigua, STIMPSON.—Shell broadly umbilicated, depressed, pellucid, greenish horn-color, marked with delicate revolving lines, and distant longitudinal ribs obliquely decussating the incremental striæ; spire scarcely elevated, apex free from striæ; whirls three and one-half, convex, the last rounded, widely umbilicated below; aperture oblique, transversely rounded, remote from the axis; peristome simple, acute, its columellar extremity not reflected. Greater diam. 2½, height ½ mill.

Fig. 63.



Hyalina exigua, enlarged.

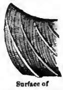
Helix exigua, STIMPSON, Proc. Bost. Soc. III, 175 (1850).—GOULD, T. M. III, 16.—W. G. BINNEY, T. M. IV, 102, pl. lxxvii, f. 19.—PFEIFFER, Mon. Hel. Viv. III, 102.—MORSE, Amer. Nat. I, 543, f. 34 (1867).

Helix annulata, CASE in Sill. Journ. [2] 1847, III, 101, f. 1–3; Ann. and Mag. Nat. Hist. 1847, 338, preocc.—PFEIFFER, Mon. III, 103.

Helix striatella, junior, testo GOULD, Sill. Journ. III, 276 (1847).

Pseudohyalina exigua, MORSE, Journ. Portl. Soc. I, 16, pl. ii, f. 8; pl. vii, f. 33 (1864).—TRYON, Am. Journ. Conch. II, 265, pl. iv, f. 57 (1866).

Fig. 64.



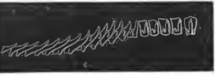
Surface of *Hyalina exigua.*

Canada, New York, and New England; Tawas Bay, Mich.

Fig. 64 shows the peculiar sculpturing of this species.

The lingual membrane has 69 rows of 16—1—16 teeth each; centrals with one long, slender, and two short cusps; laterals of same shape, but bicuspid; uncini thorn-like, aculeate, recurved, diminishing greatly in size as they pass off laterally.

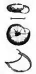
Fig. 65.



Lingual dentition of *Hyalina exigua.* [MORSE.]

Hyalina breweri, Newcomb.—Shell umbilicated, depressed, smooth, shining, surface unbroken by the wrinkles of growth, very light horn-color; spire scarcely elevated; whirls four, flattened, the last depressed, shelving towards its base; umbilicus moderate; aperture transversely lunar; peristome simple, acute. Greater diam. 5, height 2½ mili.

Fig. 66.



Hyalina breweri.

Helix breweri, Newcomb, Proc. Cal. Acad. Nat. Sci. III, 118 (1864).

Hyalina breweri, Tryon, Am. Journ. Conch. II, 250, pl. iv, f. 27 (1866).

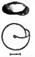
Near Lake Tahoe, California.

My figure is drawn from an authentic specimen.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
9351	1	....	Dr. J. O. Cooper.	Type figured.

Hyalina chersinella, Dall.—Shell narrowly umbilicated, depressed, transparent, lightest horn-color, shining, with distant incremental wrinkles; spire slightly elevated; whirls four, scarcely convex, the last depressed-globose; umbilicus narrow, pervious; aperture oblique, lunately-subcircular; peristome simple, acute. Greater diam. 3, height 1 mill.

Fig. 67.



Hyalina chersinella.

Helix (Conulus) chersinella, Dall, Am. Journ. Conch. II, 328, pl. xxi, fig.

Conulus chersinella, Tryon, Am. Journ. Conch. III, 162, pl. xi, f. 33–35 (1867).

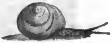
"Big Trees," Calaveras County, California.

The description and figure are drawn from an authentic specimen.

Subgenus MESOMPHIX, Raf.

Shell umbilicated or perforated, globosely-depressed, thin, striated, reddish horn-color, lighter below, shining; whirls 4½–6; aperture lunar ovate; peristome simple, straight, acute, extremities approaching, that of the columella subreflexed.

Fig. 68.

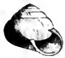


Animal of *Hyalina ligera*.

Animal (of *H. ligera*) uniform blackish slate-color over the whole upper surface, paler on the posterior extremity and base; collar grayish-white; foot narrow, exceeding in length twice the transverse diameter of the shell; eye-peduncles long and slender.

Hyalina intertexta, BINNEY.—Shell perforated, subpyramidal; epidermis yellowish horn-color; whirls six to seven, with numerous, fine, oblique striæ, and very minute, spiral striæ, intersecting each other; outer whirl with a narrow, light-colored band, and an ill-defined, brownish band below it; aperture rounded, a little transverse; peristome thin, somewhat thickened within by a deposition of testaceous matter, its columellar extremity slightly reflected at its junction with the base of the shell; perforation small, sometimes nearly obsolete; base whiter than the upper surface. Greater diam. 15, lesser 13½; height 10 mill.

Fig. 69.



Hyalina intertexta.

Helix intertexta, BINNEY, Bost. Journ. Nat. Hist. III, 413, pl. xx, f. 2 (1840); Terr. Moll. II, 206, pl. xxxvi.—PHILIPPI, Icon. II, 9, p. 5, pl. vi, f. 16.—CHEMNITZ, 2d ed. I, 208, pl. xxxiii, f. 8–10.—PFEIFFER, Mon. Hel. Viv. I, 49.—REEVE, Con. Icon. 668 (1852).—LEIDY, T. M. U. S. I, 257, pl. xii, f. 1–3 (1851), anat.—DEKAY, N. Y. Moll. 38, pl. iii, f. 29 (1843).—W. G. BINNEY, T. M. IV, 96.

Mesomphix intertexta, TRYON, Am. Journ. Conch. II, 254, pl. iv, f. 33 (1866).

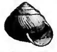
New York to Indiana; Tennessee to Georgia; also found in the postpleiocene beds in the Mississippi Valley.

The specimen figured is unusually large. There is a smaller, strongly carinated variety with a short, conical spire.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8675	3	....	W. G. Binney	Cab. series.
8753	5	....	......	......
8769	3	Sharon Springs, N. Y.	W. Stimpson.	......
8752	6	....	......	......

Hyalina ligera, SAY.—Shell perforated, orbicularly-convex: epidermis yellowish horn-color, shining; whirls seven, finely and thickly striated transversely, smooth below; suture not much impressed; aperture semilunate, rounded; peristome thin, acute; base and side of the outer whirl, within the aperture, thickened and white; perforation very small; umbilical region impressed. Greater diam. 15, lesser 13; height 10 mill.

Fig. 70.



Hyalina ligera.

Helix ligera, SAY, Journ. Acad. II, 157 (1821); BINNEY'S ed. 19.—Binney, Bost. Journ. Nat. Hist. III, 412, pl. xx, f. 1 (1840); Terr. Moll. II, 204, pl. xxxv.—Leidy, T. M. U. S. I, 257, pl. xii, f. 4-7 (1851), anat.—DeKay, N. Y. Moll. 40, excl. fig.? (1843).—Chemnitz, 2d ed. I, 108, pl. xxxiii, f. 5-7.—Deshayes in Fer. I, 184.—Pfeiffer, Mon. Hel. Viv. I, 48.—Reeve, Con. Icon. 493 (1852).—W. G. Binney, Terr. Moll. IV, 95.

Helix rafinesquea, Ferussac, Tab. Syst. 50; Hist. pl. ii, a, fig. 5; pl. i, a, f. 4, 5?—Pfeiffer, Symb. I, 39.

Helix wardiana, Lea, Trans. Am. Phil. VI, 67, pl. xxiii, f. 82; Obs. II, 67 (1839).—Troschel, Arch. f. Nat. 1839, II, 221.—DeKay, N. Y. Moll. 46.

Mesomphix ligera, Tryon, Am. Journ. Conch. II, 255, pl. iv, f. 34 (1866).

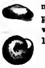
From Arkansas and Georgia to the Great Lakes; north of Maryland it does not appear east of the Appalachian chain. It is also found fossil in the postpleiocene of the Mississippi Valley.

Jaw (see Terr. Moll. I, pl. xii, f. 7) strongly arcuate, ends rounded; anterior surface striated; concave margin with a well-developed median projection.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
7939	2	Marietta, O.	W. Holden.	......
8584	7	....	W. G. Binney.	Cab. series.

Hyalina demissa, Binney.—Shell perforated, depressed-convex; epidermis yellowish horn-color, shining; whirls six, with minute lines of growth; spire obtuse; suture impressed; body-whirl expanding very little towards the aperture; aperture transverse, not large, slightly oblique; a white, testaceous deposit within; peristome thin, acute; base rather flat, smooth; perforation very small; umbilical region a little impressed. Greater diam. 11½, lesser 10½; height 6 mill.

Fig. 71.



Hyalina demissa.

Helix demissa, Binney, Bost. Journ. Nat. Hist. IV, 361, pl. xvi, f. 16 (1843); Terr. Moll. II, 232, pl. xlii, f. 1.—Pfeiffer, Mon. Hel. Viv. I, 58; IV, 48.—Reeve, Con. Icon. no. 1491.—W. G. Binney, Terr. Moll. IV, 116.

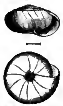
Mesomphix demissa, Tryon, Am. Journ. Conch. II, 255, pl. iv, f. 35 (1866).

Western Pennsylvania, North Carolina, Georgia, Tennessee, Alabama, and Arkansas.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8674	1	Alabama.	W. G. Binney.	Cab. series.
8833	1	Eastern Georgia.	Dr. Jones.	......
8965		Hot Spr., Ark.	Dr. B. Powell.	......

Hyalina capsella, GOULD.—Shell quite small, planorboid, pellucid, glistening, amber-colored; spire nearly plane, composed of about six and a half, closely revolving, flattened whirls; surface with distant, impressed, radiating striæ; suture margined; aperture narrow, semilunar; peristome simple, not thickened by callus within; base perforated by a deep, rather small, funnel-shaped umbilicus. Greater diam. 5, height 2½ mill.

Fig. 72.



Hyalina capsella.

Helix rotula, GOULD, Proc. Bost. Soc. III, 38 (June, 1848).—PFEIFFER, Mon. Hel. III, 107, preocc.

Helix placentula, SHUTTLEWORTH, Bern. Mit. 1852, 194.—GOULD in Terr. Moll. III, 19.—PFEIFFER, Mon. III, 631.

Helix capsella, GOULD in Terr. Moll. II, 239, pl. xxix, a, f. 1.—W. G. BINNEY, Terr. Moll. IV, 117.

Hyalina capsella, TRYON, Am. Journ. Conch. II, 252, pl. iii, f. 20 (1866).

Mountains of eastern Tennessee.

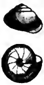
SUBGENUS CONULUS, (Fitz.) Moq.-Tand.

Shell imperforate, or very narrowly perforate, turbinate, arctispiral; whirls 5–6, rather convex; aperture depressed-lunar, the penultimate whirl strongly excided, somewhat oblique. Peristome with margins separated.

Animal (of *H. fulva*) bluish-black upon the head, neck, and eye-peduncles, lighter on the sides and base; foot very narrow, thread-like.

Hyalina fulva, DRAPARNAUD.—Shell imperforate, sub-conical, thin, pellucid; epidermis smooth, shining, minutely striated, amber-colored; whirls five or six, rounded, very narrow; suture distinct and deep; aperture transverse, narrow; peristome simple, acute; base convex; umbilical region indented, umbilicus closed. Greater diam. 4, lesser 3½; height 3 mill.

Fig. 73.



Hyalina fulva, enlarged.

Helix chersina, SAY, Journ. Phila. Acad. II, 156 (1821); BINNEY's ed. 18, 81.—BINNEY, Bost. Journ. Nat. Hist. III, 416, pl. xxvi, f. 3 (1840); Terr. Moll. II, 243, pl. xvii, f. 4.—GOULD, Invertebrata, 185, f. 105 (1841).—ADAMS, Vermont Mollusca, 162 (1842); Sillim. Journ. [1] XL, 273.—DEKAY, N. Y. Moll. 44, pl. xxxv, f. 338 (1843).—W. G. BINNEY, Terr. Moll. IV, 119.—MORSE, Amer. Nat. I, 544, f. 38 (1867).

Helix egena, Say, Journ. Phila. Acad. V, 120 (1825); Binney's ed. 30.—DeKay, N. Y. Moll. 45 (1843).—Chemnitz, ed. 2, I, 237, pl. xxx, f. 19-21? (1846).—Reeve, Con. Icon. no. 1263 (1854).—Pfeiffer, Mon. Hel. Viv. I, 31, not of Gould in Terr. Moll.

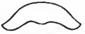
Helix fulva, Draparnaud, teste Michels (Bost. Journ. IV. 333), Chemnitz, Pfeiffer (Mon. H. I, 80), Reeve, Forbes and Hanley.

Conulus chersinus, Morse, Journ. Portl. Soc. I, 19, f. 44, 46, pl. ii, f. 4; pl. vii, f. 45 (1864).

Conulus chersina, Tryon, Am. Journ. Conch. II, 256, pl. iv, f. 37 (1866).

Common to the boreal regions of the three continents. It appears to inhabit all of eastern North America, having been found from Great Slave Lake to Texas and Florida. Dr. Newcomb catalogues it among the species found at Lake Tahoe, California.

Fig. 74.

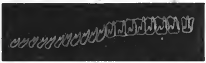


Jaw of *Hyalina chersina*. [Morse.]

Jaw arcuate, ends attennated; anterior surface smooth; concave margin smooth, with an obtuse median projection.

Lingual membrane with 80 rows of 37 teeth each (18—1—18); centrals with a long median and very short lateral cusps; laterals of the same shape, but bicuspid; uncini aculeate, bifurcate.

Fig. 75.



Lingual dentition of *Hyalina chersina*. [Morse.]

Cat. No.	No. of Sp	Locality	From whom received.	Remarks.
7915	1	10 m. bel. Ft. Berthold.	....	......
8605	2	New York.	W. G. Binney.	Cab. series.
8785	6	Massachusetts.	W. Stimpson.	......
9081	5	British America.	R. Kennicott.	......
9085	1	English River.	"	......
9333		Lake Tahoe, Cal.	J. G. Cooper.	......

Fig. 76.

Hyalina fabricii.

Hyalina fabricii, Beck.—Shell subimperforate, conical, thin, lightly striated, pellucid, reddish; spire conical, rather acute; suture profound; whirls six, convex, narrow, the last wider, rather convex at base, impressed at the centre; aperture vertical, widely lunar; peristome simple, acute, its columellar extremity reflected above, simulating a perforation. Greater diam. 4, lesser 3½; height 3 mill.

Helix fabricii, Beck, Ind. 21, no descr.—Möller, Ind. Moll. Gr. 4 (1842) —Pfeiffer, Zeit. f. Mal. 1848, V, 90; Mon. Hel. Viv. III, 32.—Reeve, Con. Icon. no. 1459.—W. G. Binney, T. M. U. S. IV, 120, pl. lxxvii, f. 17.

Helix hommonis, Ström. Trondh. selsk. skrift. III, 425, pl. iv, f. 16.

Helix nitida, Fabricius, Fauna Gr. 389.

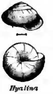
Conulus fabricii, Mörch, Nat. Bidr. af Gr. 75 (no descr.).—Tryon, Am. Journ. Conch. II, 256, pl. iv, f. 38 (1866).

Greenland.

Fig. 76 is copied from Reeve.

Hyalina gundlachi, Pfeiffer.—Shell perforated, depressed-conic, rather solid, pale rusty-brown, striated with numerous, faint lines of growth; spire elevated, having about five closely revolving, well rounded whirls, separated by a very deep suture; periphery rounded; base convexly rounded, and excavated around a small, deep perforation; aperture nearly circular, interrupted for a short space by the penultimate whirl; peristome simple, slightly expanded, and at the columellar region decidedly reflexed. Greater diam. 2½, lesser 2¼; height 1⅜ mill.

Fig. 77.



Hyalina gundlachi.

Helix gundlachi, Pfeiffer, Wiegm. Arch. 1840, I, 250; Mon. Hel. Viv. I, 50; in Chemnitz, ed. 2, I, 239, pl. xxx, f. 25–28.—W. G. Binney, Terr. Moll. IV, 121.

Helix pusilla, Pfeiffer, Arch. f. Nat. 1839, I, 351, nec Lowe.

Helix egena, Gould in Terr. Moll. II, 245, pl. xxii, a, f. 3, not of Say.

Conulus gundlachi, Tryon, Am. Journ. Conch. II, 256, pl. iv, f. 64 (1866).

Florida. Also in Cuba and St. Thomas, Porto Rico, Viéque.

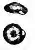
Subgenus **GASTRODONTA**, Albers.

Shell subperforate or umbilicated, orbicularly depressed, light horn-color, sometimes glassy, with more or less numerous wrinkle-like striæ; whirls 5–7; aperture lunate, its base generally furnished with fold-like denticles not reaching its margin; peristome simple, acute.

Animal without a caudal mucus pore. That of *H. interna*, with head, neck, and eye-peduncles bluish-black, or slate-color; margin and posterior part of foot white. Eye-peduncles very long, tentacles very short; body narrow and delicate, in length not much exceeding the diameter of the shell.

Hyalina lasmodon, Phillips.—Shell very much flattened above, a little convex; epidermis corneous, shining; whorls seven, narrow, very slowly increasing in diameter from the apex to the aperture, and not expanding at the aperture, with minute, transverse striæ and wrinkles; suture moderately impressed; peristome thin, acute; aperture nearly circular, within, upon the base, are two prominent, white, testaceous laminæ, nearly parallel, and extending far into the cavity of the whorl; umbilicus large, rather expanded, and deep; base smooth, well rounded from the umbilicus to the circumference. Greatest diam. 6, height 2½ mill.

Fig. 78.



Hyalina lasmodon.

Helix lasmodon, Phillips, Journ. Acad. Nat. Sci. VIII, 182 (1842); Proc. of same, I, 28 (1841).—Binney, Terr. Moll. II, 254, pl. xxxvii, f. 2.—DeKay, N. Y. Moll. 47 (1843).—Pfeiffer, Mon. Hel. Viv. III, 142.—W. G. Binney, Terr. Moll. IV, 122.

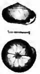
Helix mocilenta, Shuttleworth, Bern. Mit. 1852, 195.—Gould, Terr. Moll. III, 20.—Pfeiffer, *l. c.* III, 640.

Gastrodonta lasmodon, Tryon, Am. Journ. Conch. II, 257, pl. iv, f. 40 (1866).

In the mountains of northern Alabama and eastern Tennessee.

Hyalina interna, Say.—Shell very narrowly perforated, depressed, slightly convex; epidermis reddish-brown, shining; whorls eight, with regular, equidistant, elevated, oblique, rounded ribs, separated by distinct grooves; suture deeply impressed; aperture flattened, transverse, narrow; peristome thin, acute, thickened internally; within the base of the aperture, somewhat distant from the margin, are two prominent, sub-lamelliform, white teeth, not reaching the edge of the peristome; base smooth, polished, umbilical region indented. Greater diam. 5½, height 3½ mill.

Fig. 79.



Hyalina interna.

Helix interna, Say, Journ. Acad. II, 155 (1822); Binney's ed. 18.—Binney, Bost. Journ. Nat. Hist. III, 405, pl. xxi, f. 1 (1840); Terr. Moll. II, 247, pl. xxx, f. 4.—DeKay, N. Y. Moll. 46 (1843).—Chemnitz, 2d ed. I, 200, tab. ci, f. 1–4.—Pfeiffer, Mon. Hel. Viv. I, 183.—Reeve, Con. Icon. 718.—W. G. Binney, Ter. Moll. IV, 121.

Helix pomum-adami, Green, Doherty's Cab. III, 35 (1834).

Gastrodonta interna, Tryon, Am. Journ. Conch. II, 258, pl. iv, f. 42 (1866).

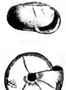
From the Alleghany Mountains to Missouri; Ohio to Georgia.

The teeth within the aperture are in general formed of a single prominent lamina, or tooth-like fold; but sometimes one, or both of them, are bifid, or even trifid. A second set often, and sometimes a third set of teeth are seen through the transparent base of the shell, irregularly striated, but generally having equal spaces between each two sets. They are apparent in the youngest as well as in the oldest specimens, and continue to be formed from time to time, so long as the shell increases in size. They probably mark regular periods of growth.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8040	5	Columbus, Ga.	Dr. J. Lewis.	……
8607	4	Georgia.	W. G. Binney.	Cab. series.
8784	20	………	……	……
8785	1	Ohio.	……	Cab. series.
8786	2	"	……	……
8788	4	………	……	……

Hyalina multidentata, Binney.—Shell umbilicated, depressed, sub-planulate above, very thin, pellucid; epidermis smooth, shining; whirls six, narrow, slightly convex, increasing but slowly in diameter, delicately striated, beneath smoother; suture impressed; aperture semi-lunate, narrow; peristome acute; umbilicus very small, rounded, pervious; base convex, indented around the umbilicus; two or more rows of very minute, white teeth, radiating from the umbilicus, are seen through the shell, within the base of the last whirl. Greater diameter 3¼, lesser 3; height 1½ mill.

Fig. 80.



Hyalina multidentata, enlarged.

Helix multidentata, Binney, Bost. Journ. Nat. Hist. III, 425, pl. xxii, f. 5 (1840); Terr. Moll. II, 258, pl. xlviii, f. 3.—Adams, Vermont Mollusca, 161 (1842).—Chemnitz, 2d ed. II, 201, pl. ci, f. 9–12.—Pfeiffer, Mon. Helic. Viv. I, 184.—W. G. Binney, Terr. Moll. IV, 123.—Reeve, Con. Icon. no. 729.—Morse, Amer. Nat. I, 543, f. 33 (1867).

Hyalina multidentata, Morse, Journ. Portl. Soc. I, 15, f. 31, p. 61, f. 30; pl. vi, f. 32 (1864).

Gastrodonta multidentata, Tryon, Am. Journ. Conch. II, 258, pl. iv, f. 43 (1866).

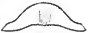
Maine, Vermont, New York, Ohio; also Lower Canada.

There are from two to four rows of very minute, delicate, white teeth, on the lower side of the interior of the last whirl, radiating from the centre. One row is usually so near the aperture as to be seen within it with the aid of a microscope; the others are more or less remote: each row contains from five to six distinct teeth. They are visible through the shell.

Jaw arcuate, broad in centre, greatly attenuated and blunt at ends; anterior surface with a few central striæ; concave margin smooth, with a slight median projection.

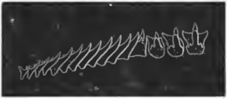
Lingual membrane with 68 rows of 15—1—15 teeth each; centrals with one very long and two small cusps; laterals of same shape, but bicuspid; uncini acute, recurved, thorn-shaped, greatly modified in size as they pass off laterally.

Fig. 81.



Jaw of *Hyalina multidentata.* [Morse.]

Fig. 82.



Lingual dentition of *Hyalina multidentata.* [Morse.]

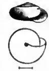
Cat. No	No. of Sp.	Locality.	From whom received.	Remarks.
9139	1	Vermont.	Dr. Stimpson.	......

Hyalina significans, Bland.—Shell umbilicate, depressed, discoidal, thin, with fine irregular striæ, which are almost obsolete at the base, shining, pale horn-colored; spire little elevated; suture slightly impressed; whirls six, subplanulate, the last roundly inflated, rather flat at the base, excavated around the umbilicus, which is pervious, and equal almost to one-fifth of the diameter of the shell; aperture oblique, depressed, lunate; peristome simple, acute. Greater diam. 4½, lesser 4; height 2 mill.

Helix significans, Bland, Am. Journ. Conch. II, No. 4, p. 372, pl. xxi, f. 9 (1866).

Gastrodonta significans, Tryon, Am. Journ. Conch. II, 163, pl. xi, f. 39–41 (1866).

Fig. 83.



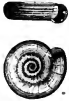
Hyalina significans.

Fort Gibson, Indian Territory.

In a young specimen of *H. significans*, having four whirls only, there are three small teeth, one by itself, and at some distance from it, two others, situated as the teeth are in *H. multidentata.* Whether these teeth are or not constant in the antepenultimate whirl of *H. significans*, I am unable to determine. (*Bland.*)

Hyalina[1] **[?] lineata,** Say.—Shell widely umbilicated, discoidal; epidermis greenish; whirls about four, visible on the base of the shell as well as above, with numerous equidistant, parallel, raised lines revolving upon them; suture much impressed; aperture remote from the axis, semi-lunate, narrow, not expanding; peristome acute, thin; umbilicus wide, forming a concave depression of the base, each volution visible to the apex; within the aperture, on the external circumference, are placed from one to three pairs of minute, conical, white teeth, the first pair in sight when looking into the aperture, the others more remote. Greater diam. 3½, lesser 3; height 1½ mill.

Fig. 84.



Hyalina lineata, enlarged.

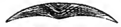
Helix lineata, Say, Journ. Phila. Acad. I, 18 (1817); II, 273 (1824); Nich. Encycl. 3d ed. IV (1819); Binney's ed. 7, 24.—Binney, Bost. Journ. Nat. Hist. III, 436, pl. xxii, f. 6 (1840); Terr. Moll. II, 261, pl. xlviii, f. 1.—DeKay, N. Y. Moll. 44 (1843).—Gould, Invert. 179, f. 103 (1841).—Adams, Vermont Mollusca, 161 (1842).—Ferussac, Tab. Syst. 44; Hist. pl. lxxix, f. 1.—Deshayes in Fer. I, 80.—Chemnitz, 2d ed. II, 203, tab. ci, f. 13–15.—Pfeiffer, Mon. Hel. Viv. I, 184.—Reeve, Con. Icon. 724 (1852).—W. G. Binney, Terr. Moll. IV, 123.—Morse, Amer. Nat. 1, 546, f. 44 (1867).

Planorbis parallelus, Say (?), Proc. Acad. Nat. Sci. II, 164 (1821); ed. Binney, 63.

Helicodiscus lineata, Morse, Journ. Portl. Soc. I, 25, f. 61, 62, pl. ii, f. 3; pl. viii, f. 63 (1864).—Tryon, Am. Journ. Conch. II, 264, pl. iv, f. 60 (1866).

Inhabits all of eastern North America, having been found from Gaspé to Texas. Also on the Rio Chama, New Mexico.

Fig. 85.



Jaw of *Hyalina lineata.* [Morse.]

Jaw narrow, long, crescentic, ends pointed; anterior surface with striæ converging to the acute median projection of the smooth concave margin.

Lingual membrane with 77 curving rows of 12—1—12 teeth

Fig. 86.

Lingual dentition of *Hyalina lineata.* [Morse.]

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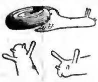
[1] Morse proposes the generic name *Helicodiscus* for this species, which I have placed doubtfully in *Hyalina.*

each; centrals very small, short, obtusely tricuspid; laterals large, with one central, long, and two side, short cusps; uncini denticulated or serrate.

Fig. 87.



Animal of *Hyalina lineata*, enlarged. [Morse.]

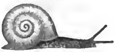
Animal nearly white or rather translucent, mottled with small white blotches; body long and narrow; upper posterior portion of foot conspicuously furrowed. In motion the shell lies perfectly flat on the extreme posterior portion of body, the eye-peduncles standing nearly perpendicularly, and the head with tentacles thrust out some way beyond the base of eye-peduncles; eyes scarcely visible; animal very short posteriorly.

Cat. No.	No. of Sp	Locality.	From whom received.	Remarks.
7906	8	Massachusetts.	W. Stimpson.	......
7907	1	Washington, D. C.	"	......
8031	10	Milwaukee, Wis.	I. A. Lapham.	......
8625	2	Georgia.	W. G. Binney.	Cab. series.

MACROCYCLIS, Beck.

Shell thin, widely umbilicated, depressed, striate or wrinkled, color uniform; whirls 4½–5, the last broad, depressed, moderately deflexed in front; aperture obliquely ovate; peristome somewhat thickened or expanded, the margins approximating, the basal shortly reflexed.

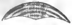
Fig. 88.



Animal of *Macrocyclis concava*.

Animal (of *M. concava*): upper surface grayish, eye-peduncles long, slender, bluish, base dirty-white, color reddish-orange, posterior extremity slightly tinged with the same; foot narrow, twice as long as the diameter of the shell, tail-pointed, scarcely reaching behind the shell; other characters as in *Helix*. Carnivorous.

Fig. 89.

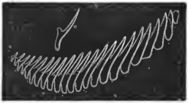


Jaw of *Macrocyclis vancouverensis*.

Jaw crescentic, ends sharply pointed, anterior surface striated; concave margin smooth, with a median projection.

Lingual membrane with numerous arched rows of aculeate, recurved, thorn-like uncini; centrals simple, conical, pointed; laterals wanting.

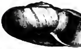
Fig. 90.



Lingual dentition of *Macrocyclis vancouverensis*.

Macrocyclis vancouverensis, Lea.—Shell widely umbilicated, depressed, very slightly convex on the upper surface; epidermis light greenish-yellow; whirls five, nearly flat above, protuberant and rounded on the lower surface, lines of growth very minute, with crowded, microscopic revolving striæ, the outer whirl expanding a little towards the aperture; umbilicus wide and deep; aperture transverse, somewhat rounded, flattened above by a depression of the peristome near its junction with the body-whirl, its edge tinged with rufous; peristome thin, acute, slightly reflected at the base of the shell, simple above, the two extremities approaching each other, and connected by a thin callus, which covers the columella. Greater diam. 31, lesser 26; height 14 mill.

Fig. 91.



Macrocyclis vancouverensis.

Helix concava, Binney, Bost. Journ. Nat. Hist. III, 372, pl. xiv (1840), not of Say.

Helix vancouverensis, Lea, Am. Phil. Trans. VI, 87, pl. xxiii, f. 72; Obs. II, 87 (1839).—Troschel, Arch. f. Nat. 1839, II, 21.—DeKay, N. Y. Moll. 45 (1843).—Pfeiffer, Symbolæ, II, 41; Mon. Hel. Viv. I, 200; in Chemnitz, ed. 2, II, 146, pl. xciv, f. 21–23.—Binney, Terr. Moll. II, 166, pl. xx.—W. G. Binney, Terr. Moll. IV, 19.—Gould, U. S. Expl. Ex. 36, f. 37 (1852).—Reeve, Con. Icon. no. 669 (1852).

Helix vellicata, Forbes, Proc. Zool. Soc. Lond. Mar. 1850, 75, pl. ix, f. 1.—Chemnitz, ed. 2, II, 454, pl. cliv, f. 42–44.—Reeve, Con. Icon. no. 673 (1852).—Pfeiffer, Mon. Hel. Viv. III, 155.

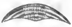
Macrocyclis vancouverensis, Tryon, Am. Journ. Conch. II, 245, pl. III, f. 6 (1866).

A west coast species, from lat. 56°, at Sitcha in Russian America, to lat. 37° (*Newcomb*). Idaho (*Cooper*).

The species is very nearly allied to *M. concava*. The differences observable are the following: the size of this shell greatly exceeds the latter in all its proportions, its transverse diameter being nearly twice as great. This difference is not caused by an increased number of whirls, for the number in both is precisely the same; but this shell seems to be projected originally upon a larger scale, the nucleus being as much larger as mature specimens. The color is much more yellow. The umbilicus is not so widely expanded, and does not admit of counting all the whirls; and the whirls seem to be more voluminous. The striæ of growth are usually coarser, and the microscopic revolving striæ are stronger and much more constantly present.

It also strongly resembles *M. sportella*, but in that species the revolving lines usually merely cut the summits of the radiating striæ, without being continuous over the whole surface.

Fig. 92.

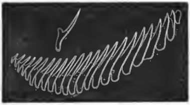


Jaw of *Macrocyclis vancouverensis*.

Jaw crescentic, ends sharply pointed; anterior surface ridged; concave margin smooth, with a median projection.

Lingual membrane with 35 arched rows of 43 teeth each (21—1—21); centrals small, ——?; laterals none; uncini long, narrow, aculeate, recurved, thorn-like, greatly modified in size as they pass off laterally.

Fig. 93.



Lingual dentition of *Macrocyclis vancouverensis*.

Animal short posteriorly, subcylindrical, very light colored, giving a straw-colored reflection, sides pearly, marked with longitudinal lines of coarse, elongated, squamose granules, about eight or ten on each side.

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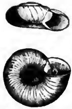
Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8354	7	....	Com. Wilkes.	......
8355	3	Oregon City.	....	......
8356	4	Oregon.	Com. Wilkes.	......
8357	3	Columbia River.	"	Young.
8358	10	....	"	......
8451	7	California.	Lt. W. P. Trowbridge.	In alcohol with animal.
8452	4	Puget Sound.	Com. Wilkes.	" "
8453	3	Columbia River.	"	" "
8169	2	Chiloweyuck Depot, Puget Sound.	A. Campbell.	" "
8546	4	....	......	Cab. series.
9206	1	St. Joseph River, second camp, Int. Oregon.	......	......
9319	2	E. of Ft. Colville, W. T.	N. W. Boundary Surv.	......

Macrocyclis concava, Say.—Shell depressed, very slightly convex on the upper surface; epidermis whitish horn-color, sometimes with a tinge of green; whirls five, above flattened, below rounded, finely striate obliquely, and sometimes with microscopic revolving lines; the outer whirl spreading a little towards the aperture; suture rather deeply impressed; umbilicus wide, deep, exhibiting all the volutions to the apex; aperture rounded, somewhat flattened above, its edge frequently tinged with red-dish-brown; peristome sub-reflected at its columellar extremity, simple above, and in some specimens considerably depressed near its junction with the outer whirl; columella with a thin callus, the edge of which connects the upper and lower extremities of the peristome. Greater diam. 21, lesser 16; height 7 mill.

Fig. 94.



Macrocyclis concava.

Helix concava, Say, Journ. Acad. II, 159 (1821); Binney's ed. 20.—Binney, Bost. Journ. Nat. Hist. III, 372 (1840), excl. pl.; Terr. Moll. II, 163, pl. xxi.—Adams, Vermont Mollusca, 159 (1842), excl. syn. *vancouverensis*.—DeKay, N. Y. Moll. 33, pl. ii, f. 15 (1843).—Pfeiffer, Mon. Hel. Viv. IV, 159.—W. G. Binney, Terr. Moll. IV, 63.—Leidy, T. M. U. S. I, 258, pl. xii, f. 9–11 (1851), anat.—Morse, Amer. Nat. I, 412, f. 26, 27 (1867).

Helix planorboides, Férussac, Hist. Nat. des Moll. tab. lxxxii, f. 4.—Pfeiffer, Mon. Hel. Viv. I, 200; Symbolæ, II, 37.—Chemnitz, ed. 2, II, 164, pl. xcv, f. 17–19; pl. cliv, f. 45 (1851).—Reeve, Con. Icon. 674 (1852).—Deshayes in Fer. I, 87.

Helix dissidens, Deshayes in Fer. Hist. I, 97, pl. lxxxiv, f. 1, 2.

Macrocyclis concava, Morse, Journ. Portl. Soc. I, 12, pl. v, fig. (1864).—Tryon, Am. Journ. Conch. II, 245, pl. iii, f. 8 (1866).

Fig. 95.

Jaw of *M. concava.*

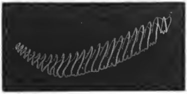
Canada to Georgia; Michigan to Missouri. Also in the postpleiocene of Mississippi Valley.

See remarks under *M. vancouverensis.*

Jaw crescentic, ends bluntly rounded; anterior surface striated; concave margin smooth, with a median projection.

Lingual membrane with — rows of 23—1—23 teeth; centrals long, slender, pointed; laterals none; uncini in a curved, transverse row, long, slender, those nearest the edge very much smaller and thorn-shaped.

Fig. 96.



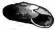
Lingual dentition of *Macrocyclis concava*.

The animal has been described and figured on p. 53.

Cat. No.	No. of Sp.	Locality	From whom received.	Remarks.
7908	1	Illinois.	......	......
7909	1	Marietta, O.	W Holden.	......
7817	3	Columbus, O.	Dr. J Lewis.	......
8620	4	....	W G Binney.	Cab. series.
8730	11	....	W Stimpson.	......
9187	12	Vermont.	L. E. Chittenden.	......

Macrocyclis sportella, Gould.—Shell much depressed, convex above, concave beneath, sloping into a broad, tunnel-shaped umbilicus; surface delicate and shining, of a pale, yellowish-green color, regularly sculptured with sharp, coarse striæ of growth, which are crossed by fine, crowded, revolving lines, which usually cut merely the summits of the radiating ridges, so that, to the naked eye, the surface appears but minutely granulated, but under a magnifier the raised spaces are seen to be well-defined squares; whirls five, separated by a deep suture, the outer one proportionally large; aperture nearly circular, a little angular at base, modified by the preceding whirl; peristome acute, simple. Greater diam. 12, height 6 mill.

Fig. 97.



Macrocyclis sportella.

Helix sportella, Gould, Proc. Bost. Soc. Nat. Hist. II, 167 (1846); Moll. Ex. Ex. 37, f. 42 (1852); T. M. II, 211, pl. xxii, a, f. 1.—W. G. Binney, Terr. Moll. IV, 19.—Pfeiffer, Mon. Hel. Viv. I, 111.—Bland, Ann. N. Y. Lyc. VII, 366; VIII, 165.

Macrocyclis sportella, Tryon, Am. Journ. Conch. II, 245, pl. iii, f. 7 (1866).

From San Diego to Puget Sound.

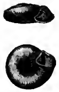
See remarks under *M. vancouverensis*.

In extreme forms of this species the revolving lines mark the whole surface, even in the umbilicus and in the interstices between the incremental striæ.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
6562	3	Ft. Umpqua, Or.	......	Cab. series.
3400	1	San Diego, Cal.	Lieut. Ives.	"
6724	1	San Francisco.	Cal. Acad. Nat. Sci.	......

Macrocyclis voyana, Newcomb.—Shell widely umbilicated, depressed, planorboid, thin, translucent, with delicate oblique striæ of growth, and fine revolving lines, more developed below, very light horn-color; spire scarcely elevated; whirls five, flattened, rapidly increasing, the last broad, flattened below, falling in front; umbilicus very large; aperture very oblique, removed from the axis, irregular truncatedly-ovate; peristome thickened, subreflected, flexuose, strongly depressed above and sinuate, ends approaching, connected with a stout, elevated, brownish, ridge-like callus. Greater diam. 21, lesser 18; height 4 mill.

Fig. 98.



Macrocyclis voyana.

Helix (Macrocyclis) voyana, Newcomb, Am. Journ. Conch. I, part 3, 235, pl. xxv, f. 4 (July, 1865).

Macrocyclis voyana, Tryon, Am. Journ. Conch. II, 246, pl. iii, f. 9 (1866).

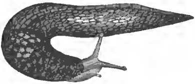
Canyon Creek, Trinity Co., California.

The specimen figured was received from Dr. Newcomb.

LIMAX, Linn.

Body lessening towards the posterior extremity, which terminates in a point. Back with a carina or keel when contracted, convex when extended. Integuments with longitudinal elongated glands, and anastomosing furrows arranged in the same manner upon both sides. Mantle anterior, oval, marked with fine concentric striæ or prominent wrinkles, unattached and free at the front and sides, but connected with the body at its posterior part, and containing in this part a testaceous rudiment or shell. Locomotive disk not expanded at margin, having a narrow band running longitudinally along its centre and separated from the sides by a well-defined line or furrow. Respiratory orifice near the right posterior margin of the mantle, large. Anal orifice immediately adjacent to, but a little above and anterior to the respiratory orifice, with a cleft or fissure through the mantle

Fig. 99.



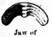
Limax flavus.

from the orifice to its edge. Orifice of organs of generation near, and immediately behind, the right superior eye-peduncle.

Testaceous rudiment thin, concentrical, not spiral, covered above with a thin and transparent periostraca, below smooth.

Jaw without ribs or marginal denticulations, its concave margin with a median projection.

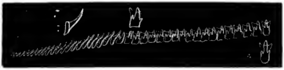
Fig. 100.



Jaw of *Limax flavus.*

Lingual membrane very broad, teeth long, central tricuspid, laterals of the same shape, but tricuspid; uncini aculeate.

Fig. 101.



Lingual dentition of *Limax flavus.*

Species of *Limax* have been found in every quarter of the globe, but they may be said to belong rather to the more temperate regions. In North America they are less common in the tertiary portions of the southern States, but are found abundantly in the middle and northern States and in the British possessions. Specimens were collected by Mr. Kennicott as far north as the junction of the Yukron and Porcupine Rivers in Russian America. The Pacific States also are inhabited by several undescribed species. The cellars and gardens of the cities of the Atlantic seaboard are infested with several European species, introduced by commerce. Like rats and mice, and various destructive insects which have proceeded from continent to continent and from island to island in the same manner, they occupy the houses and other structures, in the immediate vicinity of man, preying upon the fruits of his industry, and consuming his stores of provisions. Like them they thrive only in the vicinity of, and, as it were, in contact with man, and never withdraw from him to resume their original manner of living in the wilds. These habits are the cause of much mischief, and when the animals are numerous, render them the pests of the house and the garden. Their increase therefore, beyond a certain point, becomes prejudicial, and means are adopted to keep them in check. In various ways thousands of them are destroyed during the year, but their extraordinary fertility enables them to make the loss good and to sustain themselves in undiminished numbers.

Species of the genus found in this country can be readily confounded only with those of the genus *Arion*. They can be at once distinguished by their smooth jaw with its rostriform projection, that of *Arion* being ribbed and regularly concave; the respiratory orifice of *Limax* is on the hinder part of the shield, while in *Arion* it is on the anterior portion; the rudimentary shell of *Limax* is strong, oblong or square, while in *Arion* there are but irregular grains of calcareous matter.

There exists no confusion regarding the nomenclature and synonymy of *Limax*, though species have formerly been described under a variety of names.

The characteristics of the shield furnish points on which to base a division of the species into two subgenera—*Amalia* and *Eulimax*. In the former it has more or less prominent wrinkles, while in the latter it is regularly and concentrically striate.

SUBGENUS **AMALIA.**

Shield more or less apparently rugose, without concentric striæ.

SPURIOUS SPECIES OF AMALIA.

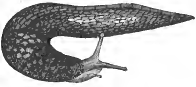
Limax columbianus, GOULD, is the same as *Ariolimax columbianus*, Gould, *q. v.*

Subgenus **EULIMAX**, Moq.-Tand.

Shield with more or less distinct concentric striæ; wrinkles none, or scarcely none.

Limax flavus, Linn.—Color brownish, yellowish-brown, or ashy brown, with oblong-oval uncolored spots, which have a longitudinal disposition; mantle with rounded spots; head, neck, and eye-peduncles blue, semi-transparent; tentacles white; base of foot sallow white. Body when extended cylindrical, elongated, terminating acutely with a short but prominent keel; upper part covered with long and narrow prominent tubercles. Mantle ample, oval, rounded at both ends, with numerous very fine concentrical striæ. Sides paler, and without spots. Respiratory foramen large, placed near the posterior lateral margin of the mantle and cleft to the edge. Generative orifice indicated by a white spot a little behind the eye-peduncle of the right side. Length, when fully extended, usually about 75 mill.; an individual kept in confinement with abundance of food attained the length of nearly 125 mill., and several others that of 200 mill.

Fig. 102.



Limax flavus.

Limax flavus, Linnæus, Syst. Nat. [X], 1758, I, p. 652 (not Müller, 1774).—Binney, Bost. Journ. Nat. Hist. IV, 164 (1842).—DeKay, N. Y. Moll. 21, pl. i, f. 5 (1843).—Gray and Pfeiffer, Reeve, &c.

Limax variegatus, Draparnaud, Tabl. Moll. 103 (1801).—Ferussac, Moquin-Tandon.—Binney, Terr. Moll. II, 34, pl. lxv, f. 1 (1851).—Leidy, anatomy, T. M. I, 248, pl. i (1851).

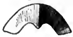
An introduced species, noticed hitherto in Massachusetts at Boston and Cambridge; in the cities of New York, Philadelphia, and Baltimore; in Virginia at Richmond; and at the University of Virginia, and at other cities. It is also found in Europe, Syria, and Madeira.

The contrast of colors, and the elegant arrangement of the spots and lines, render this a beautiful species. The tubercles of the surface are very fine, and so much compressed as to appear in some lights to be carinated. There is often a well-defined row of spots down the back. The eye-peduncles are long and delicate, the mantle sometimes terminates posteriorly in an obtuse point, and the locomotive band of the foot is narrow and well defined. There is a prominent ridge on the head and neck between the eye-peduncles, and a furrow marks the edges of the foot. It is active in its motions, turns rapidly, and often bends the body so as to form two parallel lines. It does not secrete mucus so freely as *Limax agrestis*. The carina is often yellowish. The testaceous rudiment is oblong-oval, convex above and concave below, thin and membranaceous in young individuals, with the superior surface smooth and covered with a delicate periostracum, and with the lower surface uneven. No spiral arrangement is visible to the eye, and it appears to be only a thin testaceous plate, imbedded in the mantle. In old individuals it attains a greater thickness.

It inhabits cellars and gardens in moist situations, in the cities. It is considered noxious to vegetation. It feeds upon the leaves of plants in kitchen gardens, and upon the remains of the cooked vegetables, and bread, thrown out from houses. Its most common habitat is in cellars, where it makes its presence most disagreeable by attacking articles of food, and especially by insinuating itself into vessels containing meal and flour. It is common, but not so numerous as *Limax agrestis*. The young suspend themselves by a thread of mucus.

This species is of foreign origin, but the period of its introduction is not known. It was noticed by Mr. Say, more than forty years since. It is probable that it inhabits all the cities of the sea-coast, and their vicinage, and some of the cities of the interior.

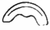
Fig. 103.



Jaw of *Limax flavus*.

Jaw of a light horn-color, its anterior surface not on one plane, but projecting towards a strong median vertical carina; arcuate, ends square, striated, concave margin smooth, with a well-developed median projection. Fig. 103 represents the usual form of the jaw, which agrees with that of a foreign individual figured by Moquin-Tandon. Fig. 103 was taken from a very large individual from Massachusetts.

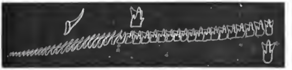
Fig. 104.



Jaw of *Limax flavus* [Moq.-Tand.]

Lingual membrane very broad, of 100 rows of 85 teeth each (42—1—42); teeth long, slender; centrals tricuspid, laterals tricuspid; uncini aculeate.

Fig. 105.

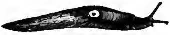


Lingual dentition of *Limax flavus*.

Cat. No.	No. of Sp	Locality.	From whom received.	Remarks.
8665	1	Burlington, N. J.	W. G. Binney.	Cab. series.

Limax agrestis, Linn.—Color varying from whitish through every shade of cinereous and gray to black, and through various shades of yellowish, or amber-color, to brownish, and sometimes irregularly spotted with small black points or dots; eye-peduncles and tentacles darker than the general surface, sometimes black; mantle sometimes mottled with a lighter color; base of foot sallow white; sheath of eye-peduncles indicated by black lines extending backwards from their base under the edge of the mantle. Body when in motion cylindrical, elongated, terminating acutely, the sides towards its posterior extremity compressed upwards, so as to form a short carina or keel; foot very narrow. Mantle oblong-oval, fleshy, convex and prominent, rounded at both extremities, equalling in length one-third of the length of the body, its surface marked by prominent, irregularly waved, concentrical lines and furrows, having their centre on the posterior part, and its edges free throughout the whole circumference. Upper surface of the body marked with longitudinal lines, or shallow furrows, darker than the general surface, sometimes black, anastomosing with each other, and forming a sort of network; between the reticulated lines are narrow, irregular oblong plates, or smooth, flattened tubercles, giving the surface the appearance of a mosaic work, with lines of dark cement; reticulations less distinct on the sides, and disappearing towards the base; a prominent tubercular ridge extends from between the eye-peduncles backward to the mantle, with a furrow on each side. Eye-

Fig. 106.



Limax agrestis.

peduncles cylindrical, about one-eighth the length of the body, with small, black, ocular points on the superior part of the terminal bulb; tentacles immediately under, very short. Respiratory foramen near the posterior lateral edge of the mantle, large, surrounded with a whitish border. Orifice of rectum immediately adjacent, but a little above and anterior to the respiratory foramen. Foot narrow; locomotive band bounded by two distinct longitudinal furrows.

Generally about 25 mill. in length, but when fully grown nearly 50 mill.

Limax agrestis, Linnæus, Syst. Nat. [X], 1758, I, 652.—Moquin-Tandon, Reeve, &c.—Binney, Bost. Journ. Nat. Hist. IV, 166 (1842); Terr. Moll. II, 37, pl. lxiv, f. 2 (1851).—Leidy, Terr. Moll. I, 250, pl. ii, f. 7-9 (1851), anat.—DeKay, N. Y. Moll. 20, pl. i, f. 4 (1843).—Morse, Journ. Portl. Soc. I, 7, f. 1, pl. iii, f. 2 (1864).

Limax tunicata, Gould, olim, Invert. 3 (1841).

It is undoubtedly of European origin. Inhabiting Boston, New York, Philadelphia, and other maritime cities of the Atlantic coast. Also in Greenland. It is common in the neighborhood of Boston, under stones at road-sides, and about stables and farm-yards, and in other moist situations, under wet and decaying pieces of wood. It is also found in cellars and gardens, and causes some mischief by its depredations. A considerable number of individuals often congregate in the same retreat. Their food appears to be the green leaves of succulent plants, and sometimes ripe fruits; they feed during the night, and are rarely found out of their retreats in the daytime. Their growth is rapid, the animal excluded from the egg in the spring arriving at full maturity and producing eggs before the succeeding winter. They defend themselves from injurious contact by instantly secreting, at the part touched, a quantity of milky-white, glutinous mucus. They are active in their motions, and soon escape when disturbed. Suspending themselves, head downwards, they lower themselves from plants and fences by forming a mucous thread which they attach to the point from which they hang. They are occasionally seen in this situation in rainy weather. During the process of excreting the mucous thread, the alternate undulating expansions and contractions of the locomotive band of the foot are seen to take place, in the same manner as when they are in motion on a plane surface.

This species is much more prolific than the others, the number of eggs deposited during the year being sometimes several hundred; its numbers, in favorable localities, are therefore very great. It begins to lay its eggs early in the spring, and continues, with intervals, until checked by the cold of approaching winter. The last deposit of them often remains in the soil until the succeeding spring, when they are hatched with the first generation of the year. The eggs are semi-transparent, and nearly globular. They produce young in about twenty days after they have been deposited.

M. Bouchard-Chantereaux has observed them to deposit eggs in sixty-six days after their own birth, and to attain their full size in eighty-two days.

This species varies very much in color, and the descriptions by different authors being drawn principally from it, differ greatly from each other; but whatever may be the color, the peculiar character of the furrows and the tubercles remains constant. In a state of contraction, the back is arched, the head is entirely withdrawn under the mantle, the glands of the skin are very prominent, making the surface appear rough, the carina is more apparent, and the posterior extremity, being a little turned to one side, appears to be oblique. It is described by some authors as constantly oblique, but the obliquity disappears when the animal is fully extended. When in motion, the head extends considerably beyond the mantle, and there is an interval between its margin, and the base of the superior tentacle, equal to the length of the tentacles. The mantle adheres to the body by its posterior central portion, and it is in this part of it that is found imbedded the testaceous rudiment, or shell. This is oval, curved above, very thin and delicate, having a transparent epidermis. At its posterior part there is a slight apical prominence, and the appearance of indistinct concentric lines of growth.

There is no considerable variation in the species except in regard to color, which varies almost infinitely.

Jaw (according to Moquin-Tandon) arcuate, ends and median projection blunt; vertical middle carina light horn-color.

Fig. 107.

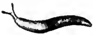
Jaw of *Limax agrestis.*

The figure of the lingual dentition of this species given by Morse (Portland Journ. I), was drawn from a species of *Arion.*

Limax campestris, Binney.—Color usually of various shades of amber, without spots or markings, sometimes blackish; head and eye-

peduncles smoky; body cylindrical, elongated, terminating in a very short carina at its posterior extremity; mantle oval, fleshy, but little prominent, with fine concentrical lines; back covered with prominent elongated tubercles and furrows; foot narrow, whitish; respiratory foramen on the posterior dextral margin of the mantle; body covered with a thin, watery mucus. Length, about 25 mill.

Fig. 108.



Limax campestris.

Limax campestris, Binney, Proc. Bost. Soc. 1841, 52; Bost. Journ. Nat. Hist. IV, 169 (1842); Terr. Moll. II, 41 pl. lxiv, f. 3.—Adams, Shells of Vermont, 163 (1842).—DeKay, N. Y. Moll. 23 (1843).—Leidy, T. M. U. S. I, 250, pl. ii, f. 5, 6 (1851), anat.

Inhabits all the New England, Middle, and Western States, and is probably widely diffused through the country.

The resemblances between some of the species of this genus are so great that it is difficult to provide them with distinctive characters, and it is only by close comparison that their differences can be seen. The present species, although considerably smaller, is nearly allied to *Limax agrestis*.

Its differential characters are as follows: It is always much smaller, and at all ages possesses a peculiarly gelatinous or semi-transparent consistency. The tuberosities of the surface are more prominent in proportion to their size, are not flattened or plate-like, and are not separated by darker colored anastomosing lines, the intervening furrows being of the same color as the general surface. It does not secrete a milky mucus at every part of the surface when touched. Like that species, it is active in its motions, and suspends itself by a thread of mucus.

This species appears to be common to all the northern parts of the United States. It is found under decaying wood in the forests and in open pastures, and under stones at road-sides. From its wide distribution, it would seem to be indigenous.

Its testaceous rudiment is minute and delicate in proportion to the small size of the animal.

Spurious Species of Limax, &c.

Limax marmoratus, DeKay. See *Tebennophorus caroliniensis*.
Limax columbianus, Gould, I have referred to *Ariolimax*.
Limax fuliginosus, Gould, and
Limax olivaceus, Gould, are erroneously referred to America by Grateloup (Distr. Geog. Lim. p. 30).

Limax lineatus, DeKay (see Terr. Moll. II, 33), is mentioned by name only, without description.

To vol. I, p. 48 *et seqq.* and vol. IV, p. 32, of the Terrestrial Mollusks, I refer for information regarding the following species of Rafinesque. Some of them are mentioned by Ferussac, Gray, Grateloup, &c., but no additional information is given by them:—

Limax gracilis (*Deroceras*). See also DeKay, N. Y. Moll. 22; Gray and Pfeiffer, Brit. Mus. Cat.

Eumelus lividus.

Eumelus nebulosus.

Rafinesque also mentions—by name only, though not from America, no locality being given—*Zilotea*, *Urcinella*, and *Testacina* (Analyse de la Nature; see Binney and Tryon's edition of Rafinesque, 17).

Subfamily HELICINÆ.

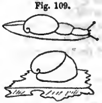
Jaw arcuate, with stout vertical ridges, reaching to and crenulating the concave margin; no middle projection.

Teeth of the lingual ribbon uniform, short, bicuspid or tricuspid.

BINNEIA, J. G. Cooper.

Body about three times as long as shell, semi-cylindrical, obtuse in front, forming an acute angle behind; foot extending the whole length, somewhat distinct anteriorly, and carinate behind. Mantle shield-like, covering the back anterior to the shell for about one-fourth its length, not reflected over the shell. Eye-peduncles moderate, slender; two short, acute tentacles in front of head. Respiratory orifice —— ? Generative orifice —— ?

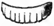
Fig. 109.



Animal of *Binneia notabilis*. [Cooper.]

Shell entirely external, unguiform, nearly flat, about one-third as long as the animal, which it does not half cover when retracted. Spire flattened, forming two horizontal volutions, last whirl enormously expanded and slightly arched. Columella distinct, entire, hiding the interior of the convolutions; peristome simple, acute.

Fig. 110.

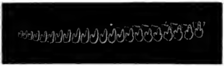


Jaw of *Binneia notabilis.*

Jaw long, rather narrow, slightly arcuate; ends but little attenuated, almost square; anterior surface with about nine very broad, crowded ribs, each with a finely notched or crenulated margin on the convex cutting edge; upper margin of the jaw concave, smooth.

Lingual membrane (of *B. notabilis*) with 100? rows of forty-three teeth each (21—1—21); centrals tricuspid; laterals and uncini bicuspid.

Fig. 111.



Lingual membrane of *Binneia notabilis.*

Fig. 112.

Binneia notabilis.

Binneia notabilis, J. G. Cooper.—Shell imperforate, depressed-orbicular, subunguiform, opaque, thin, light horn-color, striated; spire scarcely elevated; apex obtuse; suture deeply impressed; one and a half whirls, the first half with about thirty revolving, separated, prominent, abruptly ending rib like striæ, the last comprising almost the whole shell, depressed above, very rapidly increasing; aperture subhorizontal, transversely oval, very large; peristome thin, acute, simple; columella arcuate, with a thin deposit of transparent callus; apex visible from below. Greater diam. 7, lesser 3½, height 1½ mill.; greatest transverse diam. of aperture 7.

Binneya notabilis, J. G. Cooper, Proc. Cal. Acad. Nat. Sci. III, 62 (1863), figures.—Tryon, Am. Journ. Conch. II, 244, pl. iii, f. 4 (1866).

Sta. Barbara Island, California.

For views of the animal and lingual dentition, see above.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
9358	1	Santa Barbara Isl., Cal.	Dr. J. G. Cooper.	Type.

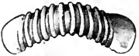
HELIX, Linn.

Body elongated, semi-cylindrical, tapering to a point posteriorly, convex above, plane beneath, the whole area forming a locomotive disk; integument reticulated by furrows; mantle simple, not extending beyond, and accurately fitting to the peristome of the shell, into which the whole animal may retire; head obtuse; eyes at the end of long, cylindrical, retractile peduncles; tentacles short, retractile; generative orifice on the side of the head, behind the right eye-peduncle; respiratory orifice in the collar, at the angle of the aperture of the shell, anal orifice immediately adjoining.

Shell discoidal, globose or conoid, aperture transverse, oblique, lunate or rounded, margins distinct.

Jaw arcuate, vertically ribbed, margins crenulated.

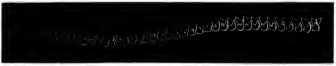
Fig. 113.



Jaw of *Helix albolabris*. [Morse.]

Lingual membrane broad, teeth numerous, centrals tricuspid, laterals bicuspid, uncini denticulated or serrated, centrals and laterals sometimes simply conical with an acute tip.

Fig. 114.



Lingual dentition of *Helix multilineata*.

Subgenus MICROPHYSA, Albers.

Shell umbilicated, depressed, thin, delicately striate, scarcely shining; spire flattened; suture distinct; whirls 4–5, rather convex, gradually increasing, the last not descending; aperture roundly lunate; peristome thin, perfectly simple, its extremities converging.

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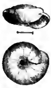
Helix vortex, Pfr.—Shell umbilicated, depressed, pale bluish-white, pearly, very thin, transparent; whirls five, prominent, with exceedingly minute, oblique striæ of increase; suture deeply impressed; base somewhat convex; axis open, umbilicus infundibuliform; aperture flattened-transverse; peristome thin, acute, not reflected. Greater diam. 6, lesser 5½; height 2¾ mill.

Fig. 115.



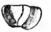
Helix vortex.

Helix vortex, Pfeiffer, Arch. f. Nat. 1839, II, 351; Mon. Hel. Viv. I, 95.—Chemnitz, ed. 2, II, 110, pl. lxxxviii, f. 7-9.—Reeve, Con. Icon. 644 (1852).—Gould, Terr. Moll. III, 34.—W. G. Binney, Terr. Moll. IV, 117.

Helix selenina, Gould, Bost. Proc. III, 38 (1848); in Terr. Moll. II, 240, pl. xxix, a, f. 2; pl. xlviii, f. 2.—Reeve, Con. Icon. 716 (1852).

Hyalina vortex, Tryon, Am. Journ. Conch. II, 252, pl. iv, f. 28 (1866).

Fig. 116.



Embryonic young of *Helix vortex*, enlarged.

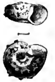
Southern Florida and the adjacent islands; also some of the West Indies.

The species is apparently viviparous—Fig. 116 representing an embryonic shell taken from an adult by Mr. Morse.

Cat. No	No. of Sp	Locality.	From whom received	Remarks.
8684	1	Florida.	W. G. Binney.	Cab. series.

Helix incrustata, Poey.—Shell umbilicated, depressed, smooth, horn-colored, usually incrusted with dirt, with crowded striæ; spire slightly elevated, composed of four or five well-rounded whirls separated by a deeply impressed suture; beneath with a broad umbilicus, one-third the diameter of the shell, exhibiting all the whirls within; aperture circular, being but slightly impinged upon by the penult whirl, its extremities joined by a slightly appressed scale of enamel, rendering the peristome continuous; peristome slightly reflexed, so as to render the aperture somewhat campanulate. Greater diam. 4⅔, lesser 4; height 2 mill.

Fig. 117.



Helix incrustata.

Helix incrustata, Poey, Memorias, I, 208, 212, pl. xii, f. 11-16.—Pfeiffer, Mon. Hel. Viv. III, 632.—W. G. Binney, Terr. Moll. IV, 68.

Helix saxicola, Gould in Terr. Moll. II, 174, pl. xxix, a, f. 4, not Pfeiffer.

Helix incrassata, Reeve, Con. Icon. 972.

Pseudohyalina incrustata, Tryon, Am. Journ. Conch. II, 265, pl. iv, f. 61 (1866).

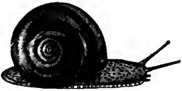
Galveston and Corpus Christi, Texas. Also near Havana, Cuba.

Subgenus **PATULA**, Hald.

Shell widely umbilicated, depressed, discoidal, turbinate, rugose or costulately-striate; whirls 4–6, equal or gradually increasing; aperture lunately-rounded; peristome simple, straight, acute.

Animal (of *Helix solitaria*) stout, short, head blunt, eye-peduncles long, slender; foot but slightly projecting posteriorly.

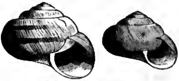
Fig. 118.



Animal of *Helix solitaria*.

Helix solitaria, Say.—Shell broadly umbilicated, globosely depressed, coarse, solid, diaphanous, obliquely and crowdedly wrinkled, from white to dark reddish horn-color with from two to three brownish revolving bands; whirls six, convex; suture deep; aperture roundedly-lunate, pearly white and banded within; peristome simple, acute, its ends joined by a thin transparent callus, that of the columella dilated, subreflected. Greater diam. 25, lesser 22; height 15 mill.

Fig. 119.



Helix solitaria and albino.

Helix solitaria, Say, Journ. Phila. Acad. II, 157 (1821); Binney's ed. 19.—DeKay, N. Y. Moll. 43, pl. iii, f. 41 (1843).—Binney, Bost. Journ. Nat. Hist. III, 426, pl. xxii (1840); Terr. Moll. II, 208, pl. xxiv.—Chemnitz, 2d ed. I, 180, pl. xxiv, f. 5, 6.—Pfeiffer, Symbolæ, II, 39; Mon. Hel. Viv. I, 102.—Reeve, Con. Icon. 662 (1852).—W. G. Binney, Terr. Moll. IV, 96.—Leidy, T. M. U. S. I, 254, pl. viii, f. 7–10 (1851), anat.

Anguispira solitaria, Tryon, Am. Journ. Conch. II, 260, pl. iv, f. 46 (1866).

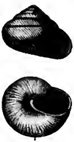
In the States north of the Ohio River, in lower Missouri, and in the Cœur d'Alene Mountains. Montana? (*Cooper*). In the postpleiocene deposits of the Mississippi Valley.

Microscopic revolving lines have been detected on some specimens. There is a form of a dark reddish-brown color, with one white band at the periphery, and the same color at the base around the umbilicus.

Cat No	No. of Sp.	Locality.	From whom received.	Remarks.
7947	1	....	W. G. Binney.	......
8016	5	....	"	......
8585	2	Ohio.	"	Cab. series.
8746	4	....	......	......

Helix ayersiana, Newcomb.—Shell umbilicated, globosely-convex, rather thick, of a dead white with a narrow revolving brownish band, with rough oblique incremental striæ deeply cut by coarse revolving lines; whirls seven, rather convex, the last globose, descending in front; spire elevated; umbilicus small; aperture oblique, subcircular, banded within; peristome simple, its ends joined by a light callus, that of the columella widened, reflected over and half concealing the umbilicus. Greater diam. 21, lesser 19; height 12½ mill.

Fig. 120.



Helix ayersiana.

Helix ayersiana, Newcomb, Proc. Cal. Acad. Nat. Sci. II, 103 (1861).

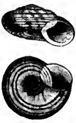
Aglaja ayersiana, Tryon, Am. Journ. Conch. II, 312 (1866); III, pl. xi, f. 28 (1867).

Northern Oregon (*Newcomb*); Santa Cruz Island, Cal. (*J. G. Cooper*).

My description and figure are drawn from an authentic specimen.

Helix strigosa, Gould.—Shell broadly umbilicated, orbicular, slightly, and about equally, convex above and beneath, surface irregular, and roughened above by indentations and coarse lines of growth, and by occasional fine revolving lines; smoother and shining beneath; color ashy gray, somewhat mottled with dusky, or altogether rusty brown above, with, usually, a single, faint, revolving band on the middle of each whirl, and often with numerous bands, unequal in size and distance, beneath; whirls five, moderately convex, the last one carinated at its commencement, and deflexed; aperture very oblique, circular; peristome simple, acute, almost continuous, terminations approaching, joined by thick callus, that of the

Fig. 121.



Helix strigosa.

columella subreflected. Greater diameter 21, lesser 18; height 10 millimetres.

Helix strigosa, Gould, Proc. Bost. Soc. Nat. Hist. II, 166 (1846); Expl. Exped. Moll. 36, f. 41 (1852); Terr. Moll. II, 210, pl. xxvi, a.—Pfeiffer, Mon. Hel. Viv. I, 121; IV, 91; Mal. Bl. 1857, 321.—W. G. Binney, Terr. Moll. IV, 23.

Anguispira strigosa, Tryon, Am. Journ. Conch. II, 261, pl. iv, f. 40 (1866).

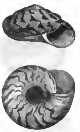
From the Rio Piedro of western New Mexico to the Big Horn Mountains, Nebraska. It seems to inhabit all the central basin.

Apparently viviparous (see Bland, Ann. N. Y. Lyc. VII, 367).

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8363	1	Int. of Oregon.	Com. Wilkes.	Cab. series.
9007		Canon Largo, N. M.	Dr. Newberry.	......
9008		Rio Pedro, N. M.	......	......

Helix alternata, Say.—Shell broadly umbilicated, orbicularly-depressed, thin, smoky horn-color varied with red, interrupted, obliquely arranged patches and spots, roughened by crowded, elevated rib-like striæ, smoother below; whirls five and one-half, flattened, the last sometimes obtusely carinated at its periphery; umbilicus large, pervious; aperture very oblique, lunately-rounded, banded within; peristome simple, acute, its terminations joined by a very thin, transparent callus, that of the columella subreflected. Greater diam. 21, lesser 19; height 10 mill.

Fig. 122.



Helix alternata.

Helix alternata, Say, Nich. Encycl. pl. i, f. 2 (1817, 1818, 1819); Journ. Philad. Acad. II, 161 (1821); Binney's ed. 6, 21, pl. lxix, f. 2.—Eaton, Zool. Text-Book, 193 (1826).—Binney, Bost. Journ. Nat. Hist. III, 428, pl. xxv (1840); Terr. Moll. II, 212, pl. xxiv.—Gould, Invert. 177, f. 114 (1841).—Leidy, T. M. U. S. I, 253, pl. vii, f. 2–5 (1851), anat.—DeKay, N. Y. Moll. 29, pl. ii, f. 9 (1843).—Adams, Vermont Mollusca, 162, fig. (1842).—Ferussac, Tab. Syst. 44; Hist. pl. lxxix, f. 8, 9, 10.—Potiez & Michaud, Galerie, 104.—Chemnitz, 2d ed. I, 181, tab. xxiv, f. 17, 18.—Pfeiffer, Mon. Hel. Viv. I, 102.—Deshayes in Fer. Hist. I, 89.—Reeve, Con. Icon. 670 (1852).—Billings, Canad. Nat. II, 99, f. 4, 5 (1857).—W. G. Binney, Terr. Moll. IV, 98.—Bland, Ann. N. Y. Lyc. VII.—Morse, Amer. Nat. I, 187, f. 17, 18 (1867).

Anguispira alternata, Morse, Journ. Portl. Soc. I, 11, f. 15; pl. iv, f. 16 (1864).—Tryon, Am. Journ. Conch. II, 261, pl. iv, f. 47 (1866).

Helix scabra, Lamarck, Anim. sans Vert. VI, part 2, 88.—Deshayes, Encycl. Méth. II, 219 (1830); in Lamarck, VIII, 66; ed. 3, III, 292. —Chenu, Ill. pl. vi, f. 11.

Helix infecta, Parreyss MS., Pfeiffer, Mal. Bl. 1857, 86; Mon. Hel. Viv. IV, 91, non Reeve.

Helix strongylodes, Pfeiffer, Proc. Zool. Soc. 1854, 53; Mon. Hel. Viv. IV, 91.—Reeve, Con. Icon. no. 1296 (1854).—*Vide* W. G. Binney, Terr. Moll. IV, pl. lxxvii, f. 8.

Helix mordax, Shuttleworth, Bern. Mitt. 1853, 195.—Gould in Terr. Moll. III, 19.—W. G. Binney, Terr. Moll. IV, 99.—Pfeiffer, Mon. Hel. Viv. III, 635.—Bland, Ann. N. Y. Lyc. VII (and var. *fergusoni*).

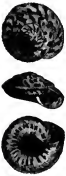
Helix dubia, Sheppard, Tr. Lit. Hist. Soc. Quebec, I, 194.—McCulloch (where?), teste Binney, Terr. Moll. I, 192.

Found over the whole of eastern North America as far north as Labrador. It is commonly found in the postpleiocene of the Mississippi Valley, retaining some of the color of the red flame-like patches.

Animal: head and eye-peduncles light slate-color, back brown, remainder of upper surface brownish-orange, eyes black, base of foot grayish-white, collar saffron. Eye-peduncles one-third of an inch long, blackish at the extremities. Foot not much exceeding in length the diameter of the shell, and terminating in a broad, obtuse, and flat extremity. A light marginal line runs along the edge of the foot from the head to the posterior part, those of the two sides meeting in an acute angle.

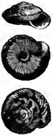
Variety: Head and neck blackish-brown, eye-peduncles blackish, foot brownish, base dirty white. In a single instance the whole animal was entirely black.

Fig. 123.



Helix alternata, carinated.

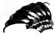
Fig. 124.



Helix alternata, var. *mordax*?

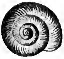
The variation of color ranges from pale straw to dark reddish-brown, in each extreme being sometimes uniform. In outline the variation ranges from depressed to very globose. In sculpturing it varies greatly. A comparatively smooth variety, with a shining, somewhat translucent epidermis has been noticed in New York, by Mr. Bland, under the name of var. *fergusoni*. A form with stronger striæ and well-developed carina is figured in Fig. 123. The coarsely striated form, which I presume to be *H. mordax*, is figured also (Fig.

Fig. 125.



Surface of *Helix alternata*.

Fig. 126.



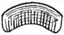
Helix alternata.

124). I have also given a figure (Fig. 125) of the magnified surface of a strongly ribbed form from North Carolina, and a view (Fig. 126) of a strongly ribbed form from the postpleiocene.

The jaw of *H. alternata* does not have the anterior ribs and crenulated concave margin characteristic of the genus. It is arcuate, equally broad in its whole length, with square ends; anterior surface strongly striate both transversely and vertically; concave margin not strongly crenulated, but having no median projection. Both the jaws figured were taken from individuals of this species.

Fig. 127.

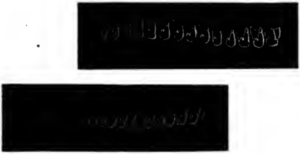
Fig. 128.



Jaw of *Helix alternata*.

Lingual membrane with 121 waving rows of 34—1—34 teeth each; centrals with one long, stout cusp, surmounted by an acute,

Fig. 129.



Lingual dentition of *Helix alternata*. [Morse.]

cone-like point, and two lateral, obsolete ones; laterals of same shape, but distinctly bicuspid; uncini at first like the laterals, but modified as they pass off laterally by the cusps becoming of more equal length.

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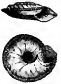
Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
7948	1	L'eau qui Court.	....	......
7964	7	....	W. G. Binney.	......
7965	1	....	"	Strongly ribbed.
7966	9	Grand Rapids, Mich.	Dr. J. Lewis.	......
7967	1	Marietta, Ohio.	W. Holden.	......
7968	6	Kansas?	......	Very high spire.
7969	3	Lake of the Woods.	R. Kennicott.	......
7970	3	Windsor, N. S.	......	......
7972	2	St. Louis, Mo.	......	......
7973	1	St. Clair River.	......	......
7974	3	Illinois.	......	......
7975	3	Milwaukee, Wis.	I. A. Lapham.	......
7976	2	Texas.	Lieut. Couch.	......
7977	4	Broken Cave, Casco Bay, Me.	Dr. J. Lewis.	......
8036	15	Goose Island, Mich.	......	......
8613	2	Ohio.	W. G. Binney.	Cab. series.
8752	3	....	W. Stimpson.	Strongly ribbed var.
8768	2	Burlington, Vt.	"	......
8781	1	Labrador (Causo).	"	......
8814	6	Texas.	W. G. Binney.	Strongly ribbed.
8833	1	Eastern Georgia.	Dr. Jones.	"
9173	900+	Vermont.	Chittenden.	......
8990		Western Texas.	......	......
8960		Hot Spr., Ark.	Dr. B. Powell.	......

Helix cumberlandiana, Lea.—Shell broadly umbilicated, lenticular, acutely carinated, rather thin, sculptured with coarse, acute rib-striæ, of a pale yellowish, or sometimes ash color, irregularly checked with radiating, waved, brown blotches; spire depressed, of about five whirls, very slightly convex, but excavated towards the margin, which is acute, and with a marginal, impressed line on both sides of the edge; beneath, somewhat less convex, but the striæ less prominent, and its centre excavated by a deep, broad umbilicus, one-third the diameter of the base, and exhibiting all the whirls to the apex; aperture rather wider than high, rendered somewhat rhomboidal by the acute carina; peristome simple, acute, its columellar extremity somewhat dilated and reflected. Greater diam. 15, lesser 13; height 5 mill.

Fig. 130.



Helix cumberlandiana.

Carocolla cumberlandiana, Lea, Trans. Am. Phil. Soc. VIII, 229, pl. vi, f. 61; Obs. III, 67; Proc. I, 289.—Troschel, Arch. für Nat. 1843, II, 124.—DeKay, N. Y. Moll. 47 (1843).

Helix cumberlandiana, Pfeiffer, Mon. Hel. Viv. I, 125; III, 114.—Binney, Terr. Moll. II, 216, pl. xxxi.—Reeve, Con. Icon. 701 (1852).—W. G. Binney, Terr. Moll. IV, 99.

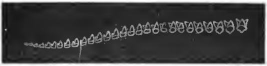
Anguispira cumberlandiana, Tryon, Am. Journ. Conch. II, 262, pl. iv, f. 48 (1866).

University Place, Franklin Co., Tennessee.

Animal dirty white, darker towards the tail, the top of the head and eye-peduncles, which last are dark slate-colored; foot about the length of the lesser diameter of the shell, with a darker submarginal line as in *H. alternata*, and terminating in a flattened, broad, spade-like extremity like the *Zonites*. When in motion none of the animal protrudes beyond the shell behind (looking from above)—before there is but little visible, about as long as the diameter of the last whirl; the breadth of the animal before the shell is about one-half the same diameter.

Lingual membrane with 86 rows of 24—1—24 stout, short

Fig. 131.



Lingual dentition of *Helix cumberlandiana*.

teeth each; centrals with a triangular base surmounted by a conical point; laterals of same shape; uncini bidentate.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
..	1	Cumberland Mts.	W. G. Binney.	......

Helix tenuistriata, Binney.—Shell flattened, the upper surface acutely carinated; epidermis light horn-color; whirls seven, narrow, increasing in width very gradually from the apex to the aperture; striated with fine, prominent, distinctly separated, curved lines; aperture angular, depressed, contracted; peristome above the carina acute, below a little reflected; base subconvex, smooth; umbilicus open, moderate in size, exhibiting two or three volutions. Greatest transverse diameter about half an inch.

Found hitherto only in the eastern part of Tennessee, whence a single specimen was brought by Mr. Haideman. This pretty species is described with some reluctance from a single specimen, as it may be considered doubtful until another be found, whether it may not be a foreign shell introduced by mistake among Tennessean shells. It is quite flat on the upper surface, rising a little towards the apex; the whirls, which are distinctly marked, are beautifully striated with delicate prominent curved lines, which are crowded towards the apex, and separated by a distinct interval on the outer whirl; they terminate on the edge of the carina, which is a little plaited by them, the base below being smooth. The aperture is narrow, and marked by an angle at the carina. The lip below the carina has a distinct, though narrow reflection. The umbilicus is moderate, conical, and rather deep, exhibiting about three volutions. In Lamarck's arrangement it would be a *Carocolla*.

Helix tenuistriata, Binney, Bost. Journ. Nat. Hist. 1842, IV, part 1, cover, p. 3.—Pfeiffer, Mon. Hel. Viv. I, 432.—W. G. Binney, Terr. Moll. IV, 118.

Helix vortex, teste Gould (non Pfeiffer), Terr. Moll. III, 34.

This is an unknown species; the above description is copied from manuscript of Dr. Binney.

Helix cooperi, W. G. Binney.—Shell umbilicated; elevated, globose; solid, coarse and rough with oblique incremental striæ intersected with delicate spiral lines; color white, variously marked with a single narrow band, or broader longitudinal and spiral patches of reddish-brown; suture impressed; spire elevated; whirls five, convex, the last rounded, very decidedly deflected at the aperture; umbilicus moderate, pervious, one-fifth the greater diameter of the shell; aperture very oblique, circular; peristome simple, thickened, with its extremities very nearly approached, and joined by a heavy white callus, that of the columella reflected. Greater diam. 20, lesser 16; height 13 mill.

Fig. 132.

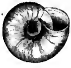


Fig. 133.

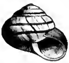


Fig. 134.

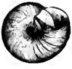


Fig. 135.

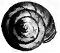


Fig. 136.

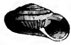
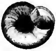


Fig. 137.



Helix cooperi.

Helix cooperi, W. G. Binney, Proc. Acad. Nat. Sci. Phila. 1858, 118; Terr. Moll. IV, 97, pl. lxxvii, f. 11.—Pfeiffer, Mal. Blatt. 1859, 6.

Anguispira cooperi, Tryon, Am. Journ. Conch. II, 260, pl. iv, f. 52 (1866).

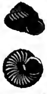
Black Hills of Nebraska and in the central basin from New Mexico to lat. 48°.

The species varies greatly in shape, as seen in the figures given of various forms. It is sometimes strongly carinated, and the peristome is sometimes made continuous by the heavy, raised callus connecting its extremities.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8677	4	Utah?	Capt. J. H. Simpson.	Cab. series.
9000		La Poudre River.	Dr. F. V. Hayden.	......
9001		Base of Big Horn.	"	......
9002		W. side Wind River Mts.	"	......
9003		....	"	......
9004		Base of Big Horn.	"	......
9005		Deer Creek Canyon.	"	......
9006		" "	"	......

Helix idahoensis, Newcomb.—Shell umbilicated, globosely elevated, thick, white, rough, with stout, distant, oblique, curving, blunt ribs, of which twenty-eight are upon the last whirl; suture impressed; spire highly elevated; apex waxen, smoother, obtuse; whirls five, convex, the last equally globose above and below, hardly falling before; umbilicus moderate, one-sixth the lesser diameter of the shell; aperture oblique, almost circular; peristome simple, made almost continuous by a heavy parietal callus connecting its approximating ends, that of the columella slightly expanded and reflected over a portion of the umbilicus. Greater diam. 13, lesser 11; height 7 mill.

Fig. 138.



Helix idahoensis.

Helix idahoensis, Newcomb, Am. Journ. Conch. II, 1, pl. 1, f. 1–3 (1866).

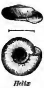
Anguispira idahoensis, Tryon, Am. Journ. Conch. II, 260, pl. iv, f. 54 (1866).

Idaho Territory, between Idaho City and Cœur d'Alene mining district.

The shell figured was received from Dr. Newcomb. The species in texture and form resembles somewhat a small elevated *Helix cooperi.*

Helix perspectiva, Say.—Shell broadly and perspectively umbilicated, orbicular, scarcely convex above, excavated below, thin, reddish horn-color, regularly ribbed; whirls six and a half, gradually increasing; aperture small, lunately subcircular, within furnished with a single subprominent tooth on the base of the shell; peristome simple, acute, its extremities separated widely. Greater diam. 8, lesser 7½; height 3 mill.

Fig. 139.



Helix perspectiva.

Helix perspectiva, Say, Journ. Phila. Acad. I, 18 (1817); Nich. Encycl. IV, ed. 3 (1819); Binney's ed. 9.—Binney, Bost. Journ. Nat. Hist. III, 430, pl. xxi, f. 4 (1840); Terr. Moll. II, 256, pl. xxx, f. 1.—DeKay, N. Y. Moll. 42, pl. iii, f. 38 (1843).—Ferussac, Tab.

Syst. 44; Hist. Nat. des Moll. pl. lxxix, f. 7.—DESHAYES in LAM. VIII, 130; 3d ed. III, 315; in FER. I, 81.—CHEMNITZ, 2d ed. II, 114, tab. lxxxv, f. 30–32; PFEIFFER, Mon. Hel. Viv. I, 103; III, 99 (excl. *H. filiola*).—REEVE, Con. Icon. 695.—W. G. BINNEY, Terr. Moll. IV, 122.—LEIDY, T. M. U. S. I, 153, pl. vii, f. 4–7 (1851), anat.

Helix patula, DESHAYES, Encycl. Méth. II, 217 (1830).

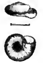
Anguispira perspectiva, TRYON, Am. Journ. Conch. II, 262, pl. iv, f. 50 (1866).

North of Maryland it is not found east of the Appalachian chain, but elsewhere is probably found over the whole of eastern North America. Also in the postpleiocene of the Mississippi Valley.

Cat No.	No. of Sp	Locality.	From whom received.	Remarks.
8014	11	Columbus, Ga.	Dr. J. Lewis.	......
8015	28	Fleming, Centre Co., Pa	......	......
8016	1	Alabama.	......	......
8017	8	Hiram, Ohio.	......	......
8018	20	N. Georgia.	A. Gerhardt.	......
8019	3	Milwaukee, Wis.	I. A. Lapham.	......
8020	15	Marietta, Ohio.	W. Holden.	......
8615	10	....	W. G. Binney.	Cab. series.

Helix striatella, ANTHONY.—Shell umbilicated, orbicularly-convex, thin, brownish horn-color, with crowded ribs; whirls four, scarcely convex, the last inflated below, rather wide; umbilicus large, pervious, aperture subcircular; peristome simple, acute, its terminations approached. Greater diam. 6, lesser 5½; height 3 mill.

Fig. 140.



Helix striatella.

Helix striatella, ANTHONY, Bost. Journ. Nat. Hist. III, 278, pl. iii, f. 2 (1840).—BINNEY, Bost. Journ. Nat. Hist. III, 432, pl. xxi, f. 5 (1840); Terr. Moll. II, 217, pl. xxx, f. 2.—GOULD, Invert. 178, f. 112 (1841).—ADAMS, Vermont Mollusca, 162 (1842).—DEKAY, N. Y. Moll. 43, pl. iii, f. 40 (1843).—CHEMNITZ, 2d ed. II, 115, tab. lxxxv, f. 36–38.—PFEIFFER, Mon. Hel. Viv. I, 104.—REEVE, Con. Icon. 727 (1853).—W. G. BINNEY, Terr. Moll. IV, 99.—MORSE, Amer. Nat. I, 545, f. 40 (1867).

Helix ruderata, ADAMS, Sill. Journ. [1] 40, 408, not STUDER.

Helix cronkheitei,[1] NEWCOMB, Proc. Cal. Acad. Nat. Sci. III, 180 (1865).

Patula striatella, MORSE, Journ. Portl. Soc. I, 21, f. 48, pl. ii, f. 6; pl. viii, f. 49 (1864).

Anguispira striatella, TRYON, Am. Journ. Conch. II, 262, pl. iv, f. 51 (1866).

Patula cronkheitei, TRYON, Am. Journ. Conch. II, 263 (1866).

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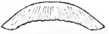
[1] My opinion of this species is formed from the description alone. I have seen no authentic example.

This is a northern species, being found through British America, at Great Slave Lake, &c., Canada, New England, and extends to Virginia and Kansas. Also on the Pacific side of the Rocky Mountains—Hell-Gate River.

Fig. 141.

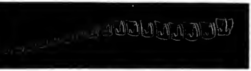


Jaw of *Helix striatella*. [Morse.]

Jaw arcuate, ends attenuated; anterior surface with converging striæ; concave margin irregularly notched, no median projection.

Lingual membrane with 100 rows of 16—1—16 teeth; centrals tricuspid, the side cusps very small; laterals of same shape, but bicuspid; laterals short, broad, bidentate.

Fig. 142.

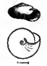


Lingual dentition of *Helix striatella*. [Morse.]

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
7927	42	Kansas.	......	In drift wood of river.
7956	22	Marietta, Ohio.	W. Holden.	......
8043	2	Cincinnati, Ohio.	J. G. Anthony.	......
8044	19	Mohawk, N. Y.	Dr. J. Lewis.	......
8590	7	....	W. G. Binney.	Cab. series.
8754	50	Massachusetts.	W. Stimpson.	......
9194	2	Labrador.	Storer.	......
9078	10	British America.	R. Kennicott.	......

Helix hornii, Gabb.—Shell umbilicated, globosely depressed, thin, coarse, reddish horn-color, under the epidermis obliquely striate, hirsute; whirls four, scarcely convex, the last inflated below; umbilicus pervious, showing the whirls to the apex; aperture oblique, subcircular; peristome simple, acute, its ends hardly approaching, that of the columella not widened, nor reflected. Greater diam. 4, lesser 3½; height 1 mill.

Fig. 143.



Helix hornii.

Helix hornii, Gabb, Am. Journ. Conch. II, 330, pl. xxi, f. 5 (1866).

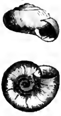
Hyalina hornii, Tryon, Am. Journ. Conch. III, 163, pl. xi, f. 36–38 (1867).

Fort Grant, Arizona, at the junction of the Arivapa and San Pedro Rivers.

My description and figure are drawn from an authentic specimen.

Helix mazatlanica, Pfeiffer.—Shell umbilicated, depressed, with crowded rib-like striæ, horn-colored; spire somewhat convex; whirls four, rather convex, perceptibly increasing, the last round, scarcely descending before; umbilicus scarcely equalling one-third the shell's diameter; aperture remote from the axis, oblique, roundly lunate; peristome simple, straight, its extremities converging, that of the columella somewhat expanding in its upper portion. Greater diam. 2¼, lesser 2; height scarcely 1 mill.

Fig. 144.



Helix mazatlanica, enlarged.

Helix mazatlanica. Pfeiffer, Mal. Blatt. 1856, 43; Mon. Hel. Viv. IV, 89.—Bland, Ann. N. Y. Lyc. VIII, 164, f. 9.

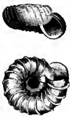
Pseudohyalina mazatlanica, Tryon, Am. Journ. Conch. II, 266, pl. iv, f. 59 (1866).

Mazatlan.

Fig. 144 is drawn from a specimen furnished me by Dr. Pfeiffer.

Helix asteriscus, Morse.—Shell widely umbilicated, orbicularly depressed, light brown, decussated by delicate incremental and revolving striæ and with from twenty five to thirty delicate, thin, transparent, prominent ribs, with waving edges and inclined backwards, more like the epidermis than the texture of the shell; whirls four, the upper ones flattened, the last globose; suture deeply impressed; aperture subcircular; peristome simple, acute, its columellar extremity subreflected. Greater diam. 1½, height ⅓ mill.

Fig. 145.



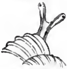
Helix asteriscus, enlarged.

Helix asteriscus, Morse, Proc. Bost. Soc. VI, 128 (1857).—W. G. Binney, Terr. Moll. IV, 103, pl. lxxvii, f. 9.—Bland, Ann. N. Y. Lyc. VIII, 163, f. 8.—Morse, Amer. Nat. 1, 546, f. 43 (1867).

Planogyra asteriscus, Morse, Journ. Portl. Soc. 1, 24, f. 50–52, pl. ii, f. 5; pl. viii, f. 53 (1864).—Tryon, Am. Journ. Conch. II, 263, pl. iv, f. 55 (1866).

From Gaspé to the north of Lake Superior, and through New England.

Fig. 146.

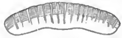


Animal of *Helix asteriscus* [Morse.]

The animal is described by Morse as bluish-white, with head, neck, and eye-peduncles mottled by streaks and dots of bluish-black; disk yellowish-white.

Jaw but slightly arcuate, of uniform width throughout, long, narrow, ends blunt; anterior surface with coarse striæ, not modifying the concave margin, which has an obtuse, wide, slight median projection.

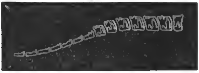
Fig. 147.



Jaw of *Helix asteriscus* [Morse.]

Lingual membrane with 77 rows of 13—1—13 teeth each; centrals very short, tricuspid; laterals long, bicuspid; uncini wide, narrow, serrate.

Fig. 148.



Lingual dentition of *Helix asteriscus*. [Morse.]

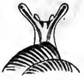
Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
9350	3	Maine.	E. S. Morse.	......

SUBGENUS **STROBILA**, Morse.[1]

Shell umbilicated, globose conic or depressed, obliquely and coarsely striated, smoother below; whirls 5 or 6, the last globose; aperture lunately rounded; peristome thickened, reflected; the parietal wall and base of the last whirl each with two or more entering revolving laminæ.

Animal quite small in comparison to the size of the shell; eye-peduncles thick, bulbous, eyes very large (*H. labyrinthica*).

Fig. 149.



Animal of *Helix labyrinthica*. [Morse.]

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[1] Journal Portland Society Nat. Hist. I, 26 (1864).

Helix labyrinthica, Say.—Shell umbilicated, globose-conic, brownish horn-color, with stout ribs above, and below lighter with arborescent wrinkles; spire obtuse; umbilicus narrow, pervious; aperture scarcely oblique, lunately rounded; peristome briefly reflected, thickened; parietal wall with three revolving, deeply entering, parallel laminæ, the central further within the aperture and less developed, and around the axis one stout lamella-like rib not reaching the columella; on the base of the outer whirl are two short, deeply seated internal revolving rib-like laminæ. Greater diam. 2½, height 1⅔ mill.

Fig. 150.

Helix labyrinthica, enlarged.

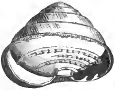
Helix labyrinthica, Say, Journ. Phila. Acad. I, 124 (1817); Nich. Encycl. ed. 3, IV (1819); ed. Binney, 10.—Binney, Bost. Journ. Nat. Hist. III, 393, pl. xxvi, f. 1 (1837); Terr. Moll. II, 202, pl. xvii, f. 3.—Gould, Invertebrata, 184, f. 106 (1841).—Adams, Vermont Mollusca, 160 (1842).—Férussac, Tab. Syst. 38; Hist. pl. II, B, f. 1.—Pfeiffer, Symbolæ, II, 31; Mon. Hel. Viv. I, 416.—Chemnitz, 2d ed. I, 382, t. lxvi, f. 17–20.—Reeve, Con. Icon. no. 728 (1852).—DeKay, N. Y. Moll. 39, pl. iii, f. 31 (1842).—Deshayes in Fer. I, 210.—W. G. Binney, Terr. Moll. IV, 95.—Morse, Amer. Nat. I, 545, f. 41, 42 (1867).

Strobila labyrinthica, Morse, Journ. Portl. Soc. I, 26, f. 64–67, pl. ii, f. 12, a b; pl. viii, f. 68 (1864).—Tryon, Am. Journ. Conch. II, 259, pl. iv, f. 44 (1866).

Inhabits all of eastern North America.[1] Also occurs in the postpleiocene of the Mississippi Valley.

Mr. Morse has lately given the following description of the internal laminæ which characterize this species:—

Fig. 151.



Helix labyrinthica, enlarged.

The shell has been described as having one revolving tooth within the aperture, and sometimes a second one terminating farther within the aperture. I have always found this second one constant, and also a *third* one but slightly raised between these two. At the base of the shell and far within the aperture are two more revolving ribs, running about a third of one volution. These are plainly visible through the substance of the shell. A heavy columellar tooth or rib extends from a slight distance within the aperture, nearly one volution back. This columellar tooth thickens the substance of the shell in the umbilical region and causes a distinct fold without the shell. A most singular feature is revealed in the structure of the parietal laminæ. With an ordinary magnifying power, small swellings are seen at close intervals along these laminæ, which, when magnified four hundred diameters, are seen to be surmounted with from five to ten sharp spines pointing towards the aperture. These swellings appear to coincide in number and position with the raised ribs without the shell, though they are not formed at the same time: for as these laminæ approach the aperture they become attenuated and disappear. The surface upon which these laminæ rest is granulated, and not smooth as is generally the case with the interior of shells. It is difficult to imagine the use of these spiny projections, unless they may act in some way as points of resistance to the animal for the support of a very heavy shell.

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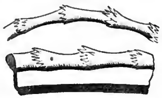
[1] Woodward (Man. 384) refers an extinct English Eocene *Helix* to this species. I have seen no specimens of it, but cannot believe it identical. Mr. Bland writes me that he has received from France a fossil shell under the name of *H. labyrinthicula*, apparently identical with our species.

Fig. 152.

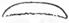


Parietal laminæ of *Helix labyrinthica.*

Jaw long, narrow, very slightly arcuate, ends pointed; concave margin slightly notched.

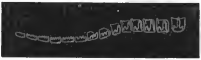
Lingual membrane with 78 rows of 13—1—13 teeth each; centrals tricuspid, central cusp very long; laterals of same shape but bicuspid; uncini short, broad, serrated.

Fig. 153.



Jaw of *Helix labyrinthica.* [Morse.]

Fig. 154.



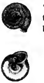
Lingual dentition of *Helix labyrinthica.* [Morse.]

Cat No.	No. of Sp.	Locality.	From whom received.	Remarks.
7935	5	Massachusetts.	W. Stimpson.	......
7936	6	Maine.	Dr. J. Lewis.	......
8045	3	Milwaukee, Wis.	I. A. Lapham.	......
8379	10	....	W. G. Binney.	Cab. series.

Helix hubbardi, Brown.—Shell umbilicated, depressed, thin, obliquely striated above, smooth below, reddish horn-color; whirls four and a half to 5, convex, regularly increasing, the last but slightly descending;

umbilicus wide; aperture quite oblique, subcircular; peristome thickened, somewhat reflected, white, not covering the umbilicus; internal laminæ four, two upon the parietal wall of the aperture, of which the upper one is much more developed than the lower; the two remaining ones placed deep within the last whirl on its base. Greater diam. 2½, height 1¼ mill.

Fig. 155.



Helix hubbardi, enlarged.

Helix hubbardi, A. D. BROWN, Proc. Acad. Nat. Sci. Philad. 1861, 333.
Strobila hubbardi, TRYON, Am. Journ. Conch. II, 259, pl. iv, f. 45 (1866).[1]

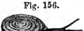
Found near Indianola, Calhoun Co., Texas.

SUBGENUS POLYGYRA, Say.

Shell umbilicated or perforated, orbicularly flattened, obliquely and costulately striate; whirls 5–7½, gradually increasing, the last anteriorly constricted, briefly deflected, inflated below, devious, the penultimate whirl plainly conspicuous, very often constricting the rimate umbilicus; aperture subreniform, or irregularly sinuate; peristome narrowly reflected, heavy, its margins usually dentate and joined by a triangular, dentiform callus, obliquely entering on the parietal wall of the aperture.

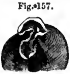
Animal very small and short in proportion to size of shell, with long, slender eye-peduncles; shell carried horizontally.

Fig. 156.



Animal of *Helix septemvolva*.

Fig. 157.



Helix auriculata, enlarged

Helix auriculata, SAY.—Shell rimately perforated, flattened above, inflated below, with rib-like striæ, reddish horn-color or brownish; whirls five and a half, narrow, the last deflected at the aperture, disjoined, constricted and scrobiculated below; umbilicus level, showing only the penultimate whirl; aperture subhorizontal, ear-shaped, ringent, almost closed; peristome continuous, its terminations joined by an oblong, entering, excavated fold, the right margin furnished within with a deep lamellar fold, and forming a subacute angle with the basal margin, on which is one broad tubercle. Greater diam. 16, lesser 13; height 7½ mill.

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[1] This figure does not correctly represent the species. In quoting it I mean to say that it was intended to represent the species. The same remark applies to many other figures in the same Monograph.

Polygyra auriculata, Say, Nich. Encycl. 3d Am. ed. (1819); Journ. Phila. Acad. I, 277 (1818); Binney's ed. 10.

Helix auriculata, Ferussac, Hist. pl. l, f. 4 (1822).—Binney, Bost. Journ. Nat. Hist. III, 384 (ex parte), pl. xix, f. 1 (1840), excl. syn.; Terr. Moll. II, 186, pl. xl, f. 1 (left hand).—Leidy, T. M. U. S. I, 255, pl. ix, f. 5, 6 (1851), anat.—DeKay, N. Y. Moll. 47, pl. iii, f. 28 (1843). —Pfeiffer, Mon. Hel. Viv. I, 417; IV, 318, excl. var. (1853).—Chemnitz, ed. II, 371, t. lxv, f. 3, 4.—Deshayes in Fer. Hist. 76 (excl. var.), pl. l, f. 4; in Lam. VIII, 112: ed. 3, III, 308.—Reeve, Con. Icon. no. 700, excl. fig. (1852).—Bland, Ann. N. Y. Lyc. VII, 26, fig. (1858).—W. G. Binney, Terr. Moll. IV, 73.

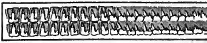
Dædalochila auriculata, Tryon, Am. Journ. Conch. III, 157, pl. xl, f. 13, 14 (1867).

St. Augustine, Florida.

H. auriculata may be distinguished from the allied species by its larger size, the greater development of the several parts of its curious aperture, and especially by the sudden outward deflexure of the central part of the labrum, which has a deep scrobiculation behind it, corresponding with the upper tooth within the aperture. The portion of the labium extending from the inferior angle of the parietal intruded tooth is erect, and more elevated than in any other of the species.

Lingual membrane with — rows of 22—1—22 teeth each;

Fig. 158.



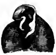
Lingual dentition of *Helix auriculata*. [Leidy.]

centrals tricuspid, the side cusps very short; laterals of the same shape but bicuspid; uncini with two or more sharp points.

Cat. No.	No. of Sp	Locality.	From whom received.	Remarks.
8614	4	St. Augustine, Fla.	O. M. Dorman.	Cab. series.

Helix uvulifera. Shuttleworth.—Shell rimately perforated, flat above, inflated below, striated, reddish horn-color or brownish, rather solid, shining; whirls five, slowly increasing, narrow, the last abruptly deflected at the aperture, devious below, constricted and scrobiculated; aperture very oblique, ear-shaped, ringent, very much narrowed; peristome acute, patulously reflected, its terminations joined by an oblong, tongue-shaped, deeply entering, excavated fold, its right margin with a deeply seated lamella terminating in a reflected, filiform uvula-like point, the basal margin with an oblique, sinuose tooth-like tubercle. Greater diam. 12, lesser 11; height 7 mill.

Fig. 159.



Helix uvulifera, enlarged.

Helix uvulifera, SHUTTLEWORTH, Bern. Mitt. 1852, 199.—CHEMNITZ, ed. 2, II, 420, pl. cxlviii, f. 19, 20 (1853).—GOULD, Terr. Moll. III, 20.—W. G. BINNEY, Terr. Moll. IV, 75 (fig.).—PFEIFFER, Mon. Hel. Viv. III, 267.—BLAND, Ann. N. Y. Lyc., N. H. VII, 34, f. 13 (1858).

Helix florulifera, REEVE, Con. Icon. no. 699 (Aug. 1852).

Helix auriculata, minor, FÉRUSSAC, Hist. pl. 1, f. 3? (teste PFEIFFER).

Dædalochila uvulifera, TRYON, Am. Journ. Conch. III, 157, pl. xi, f. 15, 16 (1867).

Found plentifully on the Florida Keys. As I also have specimens from Corpus Christi, it probably inhabits the whole Gulf coast.

H. uvulifera may be distinguished from *H. auriculata* by the character of the peristome, which is equally produced from the superior angle of the parietal process, to the base of the inferior tooth or fold, where it is reflected, sometimes appressed to the last whirl. The lower angle of the parietal process is connected with the inner termination of the peristome by a flat, more or less developed callus. The umbilical region is less open, and there is no groove within it on the last whirl.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8646	8	Florida.	W. G. Binney.	Cab. series.
8766	33	"	W. Stimpson.	......

Helix auriformis, BLAND.—Shell rimately perforate, above depressed, with rib-like striæ, beneath inflated, convex, almost smooth, and with microscopic spiral lines; white, or brown horn-color, thin; spire very short; whirls five and a half to six, rather flat, the last deflected, and shortly turned outwards from the preceding whirl, constricted, scarcely scrobiculate; aperture sub-horizontal, ear-shaped, contracted; peristome acute, continuous, the margins joined by a short linguiform fold, entering within the aperture; the right

Fig. 160.

Helix auriformis. [BLAND.]

margin with an obtuse submarginal lamella, and the base with an oblique sinuous, tooth-like fold. Greater diam. 11½, lesser 10; height 6 mill.

Helix auriformis, Bland, Ann. N. Y. Lyc. VII, 37, fig. (1858).
Helix auriculata, Binney, Bost. Journ. Nat. Hist. (ex parte,) pl. xix, f. 2 (1840); Terr. Moll. II, 186 (ex parte), pl. xl, f. 1 (right hand), 2. —Reeve, Con. Icon. 700.—Deshayes in Fér. Hist. var. *minor*, pl. l, f. 3.
Helix avara, Chemnitz, ed. 2, 370 (ex parte), t. lxv, f. 1-2.—Pfeiffer, Mon. Hel. Viv. I, 418.—Reeve, Con. Icon. 720.
? *Helix sayii*, Wood, Ind. Suppl. pl. vii, f. 34; ed. Hanley, 228, f. 34.—DeKay, N. Y. Moll. 47.
Dædalochila auriformis, Tryon, Am. Journ. Conch. III, 155, pl. xi, f. 1-3 (1867).

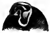
From Texas to Georgia it is an extremely common species. Immense beds of semi-fossil specimens are found in middle Alabama.

This species is common in American cabinets, and usually labelled *H. avara*, or var. of *H. auriculata*, but it appears entirely distinct. It is most nearly allied to the former, but is larger, not hirsute, and has the groove in the last whirl within the umbilical region like the latter. The parietal fold is somewhat similar to, but does not descend so far into the aperture as that of *H. postelliana*, but the teeth on the labrum are in form and position, though more developed, rather like those of *H. avara*. They are separated by the same deep sinus, but the upper one generally without the sharp reflexed hook at its termination.

Cat. No.	No. of Sp	Locality.	From whom received.	Remarks.
8030	8	Alabama.	W. G. Binney.	......
8626	8	"	T. Bland.	Cab. series.

Helix postelliana, Bland.—Shell rimately perforate, above slightly convex, with rib-like striæ wider apart and more prominent behind the aperture; beneath inflated, convex, almost smooth, and with microscopic spiral lines: brown horn-color, thin, shining, subpellucid; whirls five, gradually increasing, rather convex, the last deflected and turned outwards from the preceding one, scrobiculate, constricted, grooved within the umbilical region; suture impressed; aperture oblique, ear-shaped, contracted; peristome white, acute, continuous, the margins joined by a tongue-shaped fold, excavated

Fig. 161.



Helix postelliana, enlarged. [Bland.]

above, entering into the aperture, the right margin having a deeply-seated lamella, which terminates in a reflexed hook, the base with an erect lamelliform, scarcely oblique tooth, produced into, and recurved within the aperture. Greater diam. 9½, lesser 8½; height 5 mill.

Helix postelliana, Bland, Ann. N. Y. Lyc. VII, 35, fig. (1858).
Dædalochila postelliana, Tryon, Am. Journ. Conch. III, 156, pl. xi, f. 10–12 (1867).

Georgia.

It is smaller than *H. auriculata*, and the rib-like striæ which cover the whole of that shell, are scarcely developed at the base. The form of the parietal process is very like that of *H. uvulifera*, but the continuation of its inferior angle to the inner termination of the peristome is not prostrate as in that species, but erect as in *H. auriculata*. The position and form of the upper tooth on the peristome is much the same as in that species, and in *H. uvulifera*, but the lower one is entirely different. In those it is an oblique, strongly developed, convex, sinuous fold on the margin of the peristome, not descending into the aperture, there being within a slight thickening only, corresponding with the lower exterior apertural depression. In *H. postelliana* there is at the base of the peristome a thin, erect, oblong, lamelliform tooth, rather oblique, but more closely marginal than the fold in the other species. The exterior of this tooth is convex, within concave; it is 1 mill. in height, and 1½ in length, and descends rapidly into the aperture, where it is recurved, and terminates obtusely opposite to the lower end of the superior tooth, there being a very distinct and tortuous sinus between the two. In opening specimens from different localities, these characters are found to be constant.

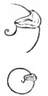
Cat No.	No. of Sp.	Locality.	From whom received.	Remarks.
8647	2	Georgia.	T. Bland.	Cab. series.

Helix espiloca, Ravenel.—Shell rimately perforate, above slightly convex, beneath convex, striated, reddish horn-color, thin, with very short hairs; spire scarcely elevated; whirls five, rather convex, the last deflected and turned outwards from the preceding one, scrobiculate, constricted, grooved within the umbilical region; aperture very oblique, subreniform, contracted; peristome acute, continuous, the margins joined by a lamella, excavated above, and produced into a tongue-shaped tooth;

the right margin having a broad hooked lamella, and the base an erect lamelliform tooth produced into and recurved within the aperture. Greater diam. 9, lesser 8; height 4 mill.

Helix espiloca, Ravenel, MS., Bland, Ann. N. Y. Lyc. VII, 115, pl. iv, f. 1, 2.
Dædalochila espiloca, Tryon, Am. Journ. Conch. III, 156, pl. xi, f. 7-9 (1867).

Fig. 162.



Helix espiloca

Sullivan's Island, South Carolina.

In the form of the parietal process, it is intermediate between *H. postelliana* and *H. avara*, but most like the latter; the teeth on the peristome are very similar to those in the former, but beneath it is less inflated, the umbilical region is wider, showing more of the penultimate whirl, and it is hirsute.

Helix avara, Say.—Shell rimately umbilicated, depressed-convex above, convex below, striated, especially near the aperture, horn-colored, thin, covered with numerous short, robust hairs; spire convex, not much elevated; whirls four, rounded, the last more convex, constricted behind the peristome, not grooved within the moderate umbilicus; aperture very oblique, subreniform, contracted; peristome white, acute, elevated, continuous, its terminations connected by an elevated, oblique angular fold; the columellar margin furnished with two projecting, obtuse, curved teeth, separated by a deep sinus. Greater diam. 7, lesser 6; height 3 mill.

Fig. 163.

Helix avara,[1] enlarged.

Polygyra avara, Say, Nich. Encycl. 3d Am. ed. (1819); Journ. Phila. Acad. I, 277 (1818); ed. Binney, 11.—DeKay, N. Y. Moll. 47 (1843).
Helix avara, Férussac, Hist. pl. 1, f. 2.—Pfeiffer, var. *β. minor*, Mon. Hel. Viv. I, 418 (ex parte).—Deshayes in Fer. Hist. II, 78, pl. I, f. 2.—Chemnitz, ed. II, 370 (ex parte), excl. fig.—Reeve, Con. Icon. (ex parte), no. 720, excl. fig.—Bland, Ann. N. Y. Lyc. VII, 20, fig. (1858).—W. G. Binney, Terr. Moll. IV, 74.
Dædalochila avara, Tryon, Am. Journ. Conch. III, 155, pl. xi, f. 4-6 (1867).

St. John's River, Florida.

H. avara, Say, may be readily distinguished by its smaller size, more delicate texture, and less globose form—it has from four to four and a half whirls, and is the only species of the group which is hirsute, except *H. espiloca*. The superior tooth on the peristome is armed with a hook as in the other species, but is narrower, less deeply seated, and more erect; the inferior one is rather a distinct tooth than a lamellar fold. The parietal process differs entirely from that of *H. auriculata*, as plainly shown in the figure. *H. avara* is without the groove on the last whirl which prevails in *auriculata*, and the forms represented by Dr. Binney as varieties of it. It is very rare in collections: I know of but two specimens of it.

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[1] The *striæ* in Fig. 163 are incorrectly represented: they should have been shown only at the termination of the last whirl, over a small space immediately behind the peristome.

Helix ventrosula, Pfeiffer.—Shell rimately perforated, globosely depressed, thin and shining, pellucid, delicately striated, horn-colored; spire slightly raised; whirls five, but little convex, the last one subangulated above, falling suddenly towards the aperture, inflated below, anteriorly gibbous and contracted; aperture very oblique, ringent; peristome acute, broadly reflected, its terminations scarcely approaching each other, but joined by two white, elevated laminæ, which are placed at acute angles on the parietal wall; the basal margin is also furnished with two white acute denticles; on the right margin is placed a white sub-perpendicular, extended lamina. Greater diam. 13, lesser 11; height 7½ mill.

Fig. 164.

Helix ventrosula.

Helix ventrosula, Pfeiffer, Proc. Zool. Soc. 1845, 131; Mon. Hel. Viv. I, 417; in Chemnitz, ed. 2, I, 373 (1846), pl. lxv, f. 5, 6 (1849).—Reeve, Con. Icon. no. 687 (1852).—W. G. Binney, Terr. Moll. IV, 73, pl. lxxvii, f. 14.

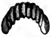
Dædalochila ventrosula, Tryon, Am. Journ. Conch. III, 63, pl. x, f. 35, 39 (1867).

Texas and Mexico. The specimen which furnished Figs. 165 and 166 is from the Sierra Madre.

Jaw strongly arcuate, of uniform width, ends blunt, anterior surface with broad ribs, crenulating both margins.

Lingual membrane with 93 rows of 24—1—24 teeth each; centrals tricuspid, the side cusps very small; laterals of same shape, but bicuspid; uncini irregularly and bluntly serrate.

Fig. 165.



Jaw of *Helix ventrosula.*

Fig. 166.

Lingual dentition of *Helix ventrosula.*

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
9328	7	Colima, Sierra Madre.	Xantus.	……

Helix hindsi, Pfeiffer.—Shell narrowly umbilicated, depressed, delicately striate, brownish horn-color, diaphanous, thin, shining; spire slightly elevated; whirls five, flattened, the last deflected at the aperture, more convex and constricted below; umbilicus pervious; aperture very oblique, lunate, ringent; peristome slightly reflected, its terminations converging, joined by a triangular, tooth-like, two-forked callus, the right hand margin with one sub-vertical lamina, the columellar margin with two acute denticles. Greater diam. 8, lesser 7; height 4½ milli.

Fig. 167.

Helix hindsi.

Helix hindsi, Pfeiffer, in Proc. Zool. Soc. 1845, 132; Mon. Hel. Viv. I, 416; in Chemnitz, 2d ed. I, 373, tab. lxv, f. 7, 8.—Reeve, Con. Icon. 712 (1852).—Gould, in Terr. Moll. III. 17.—W. G. Binney, Ter. Moll. IV, 92, pl. lxxviii, f. 5, 6, 8.
Dædalochila hindsi, Tryon, Am. Journ. Conch. III, 63, pl. x, f. 24, 44 (1867).

Texas and Mexico.

Helix texasiana, Moricand.—Shell rimately perforated, depressed, orbicular, rather solid, of a pale horn-color, sometimes with a revolving rufous band, with crowded rib-striæ above, smooth, or faintly striated, and shining beneath; spire nearly flat, of five whirls separated by a well-marked suture, the outer one obtusely angular at periphery, nearly at the plane of the spire, and somewhat deflected near the aperture; beneath convexly rounded, with a somewhat distorted appearance in consequence of the whirl becoming narrower, rather than broader, towards the aperture, leaving a minute umbilical perforation; aperture very oblique, narrow lunate, the peristome forming about two-thirds of a circle, reflected, white, with a constriction behind it, and armed with two denticles at its inner margin, one near the centre, the other at the middle of the basal portion; the extremities of the peristome connected by a callus across the columella, of an acutely angular form, pointing to the middle of the portion of the peristome above the upper denticle, the lower ramus of the angle being longest and largest, and a little concave inwardly. Greater diam. 10, lesser 8½; height 5 milli.

Fig. 168.

Helix texasiana.

Helix texasiana, Moricand, Mem. Soc. Phys. Hist. Nat. de Géneve, VI, 538, pl. 1, f. 2 (1833).—Deshayes in Lamarck, VIII, 133; ed. 3, III, 316; in Fer. I, 74, pl. 1, e (excl. syn.).—Ferussac, Hist. des Moll. pl. lxix, D, f. 2.—Pfeiffer, Mon. Hel. Viv. I, 418, excl. syn. and var. β; vol. IV, 318.—Chemnitz, ed. 2 (1846), I, 85, excl. var.

and figure.—Reeve, Con. Icon. no. 707.—Binney, Terr. Moll. II, 191, pl. xlv, f. 1.—W. G. Binney, Terr. Moll. IV, 79.
Helix auriculata, Binney, Bost. Journ. Nat. Hist. III, 387.
Helix tamaulipasensis, Lea, Proc. Acad. Nat. Sci. Philad. 1857, 102; Journ.—; Obs. XI, 139, pl. xxiv, f. 113.
Dædalochila texasiana, Tryon, Am. Journ. Conch. III, 62, pl. x, f. 5, 36, 38 (1867).

Texas and the neighboring Mexican State of Tamaulipas.

There is a variety larger, with six whirls, and with a brown band revolving above the periphery.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
7923	7	Texas.	Dr. B F. Shumard.	......
7921	16	Tamaulipas, Mex.	Lieut. Couch.	(*H. tamaulipasensis*, Lea, came from this lot.)
8006	27	Texas.	"	Cab. series.
8616	9	"	"	......
8669	3	....	W. G. Binney.	Cab. series.
8751	2 0?	Texas.	G. Wurdemann.	......
8080		San Felipe Spr.	Lieut. Beale.	......

Helix triodontoides, Bland.—Shell umbilicated, globose-depressed, thin, subpellucid, pale horn-colored, with partially obsolete rib-like striæ above; base convex, smooth; spire short; whirls five, somewhat convex, the last plicately ribbed near the aperture, deflexed anteriorly; aperture roundly lunate, oblique, contracted; peristome reflected, callous, the margins joined by a sharp linguiform triangular tooth, the right with a tooth on the margin of the callus, basal with an oblique tooth, both teeth small and far apart. Greater diam. 9½, lesser 8; height 5 mill.

Fig. 169.

Helix triodontoides.

Helix triodontoides, Bland, Ann. N. Y. Lyc. VII, 424, pl. iv, f. 11, 12 (1861).
Helix texasiana, W. G. Binney, Terr. Moll. IV, 79, pl. lxxviii, f. 18.
Dædalochila triodontoides, Tryon, Am. Journ. Conch. III, 62, pl. x, f. 10, 31 (1867).

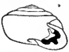
Corpus Christi and De Witt Co., Texas.

H. triodontoides is a more delicate shell than *H. texasiana*; and does not attain the same size. It is not as distinctly ribbed, is somewhat more elevated, and the aperture is more round. The last whirl is less devious at its termination beneath, the peristome teeth are smaller and wide apart. In *H. texasiana* they are close together, and the space between them has much resemblance to the notch in *H. hirsuta*. In that respect, as well as in the form of the aperture, Moricand's shell is more closely allied to *H. mooreana*, W. G. Binn.

Cat. No.	No. of Sp	Locality.	From whom received.	Remarks.
9360	1	Texas.	W. G. Binney.	......

Helix mooreana, W. G. Binn.—Shell umbilicated, orbicular, globose, white, subcarinated; spire more or less depressed, obtusely rounded; whirls six, distinctly striated, hardly convex; suture impressed; below the carina the body-whirl is not rounded, but slants down to the base which is parallel with the suture; below, the striæ are less distinct; at the umbilical region only one and a quarter whirl is visible, the outer one strongly carinated so as to conceal a portion of the umbilicus and a great part of the remaining whirl; the umbilicus is very small, but perforates the shell to the apex, showing all the volutions with the aid of a lens; aperture rounded, contracted by three teeth; peristome heavy, broad, white, hardly reflected, near the basal extremity, quite on the edge, armed with two short, incurving teeth, separated by a small, rounded sinus; on the columella there is a tooth-like fold, square, projecting across the aperture, its extremities joining those of the peristome; an internal transverse tubercle on the base of the shell. Greater diam. 8½, lesser 7; height 3 mill.

Fig. 170.



Helix mooreana, enlarged.

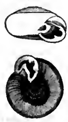
Helix mooreana, W. G. Binney, Proc. Acad. Nat. Sci. Philad. 1857, 184; Terr. Moll. IV, 80, pl. lxxviii, f. 24.—Pfeiffer, Mon. Hel. Viv. IV, 52.
Dædalochila mooreana, Tryon, Am. Journ. Conch. III, 64, pl. x, f. 8 (1867).

Washington Co., Texas. Also in the neighboring Mexican States.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8670	8	Texas.	Lieut. Couch.	Cab series.
8984		Leon.	Lieut. Blake.	......

Helix tholus, W. G. Binney.—Shell broadly umbilicated, depressed-globose, rather solid, white, shining, ribbed above, smoother below; spire obtuse, little elevated, rounded; whirls seven, convex, the upper ones more flattened, the last bluntly carinated; carina not reaching the peristome; base parallel to the suture; umbilicus broad, half the larger diameter of the shell, showing two and a half deeply grooved whirls plainly, the others rapidly retreating towards the apex; aperture very oblique, semicircular, removed from the axis of the shell, bordered with a scarcely reflected, white, heavy peristome, grooved behind, and armed with two stout teeth near the basal extremity, broadly reflected at the

Fig. 171.



Helix tholus, enlarged.

junction with the body whirl; on the parietal wall of the aperture is a white fold, hardly connecting the extremities of the peristome, and projecting across the aperture into an acute point; an internal transverse tubercle on the base of the shell. Greater diam. 11, lesser 9; height 4 mill.

Helix tholus, W. G. Binney, Proc. Acad. Nat. Sci. Philad. 1857, 186; Terr. Moll. IV, 81, pl. lxxvii, f. 21.—Pfeiffer, Mon. Helic. Viv. IV, 351.
Dædalochila tholus, Tryon, Am. Journ. Conch. III, 64, pl. x, f. 7, 9 (1867).

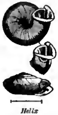
Washington Co., Texas.

The specimens from which the descriptions of *H. mooreana* and *H. tholus* were drawn are widely different, but a study of a large suite of individuals leads to doubt their specific distinction.

Cat. No	No. of Sp.	Locality.	From whom received.	Remarks.
8741	2	Texas.	W. G. Binney.	Cab. series.

Helix hippocrepis, Pfeiffer.—Shell rimately perforated, depressed, rather heavy, closely striated, opaque, smoky; spire flattened; suture impressed; whirls five and a half, narrow, scarcely convex, the last subcarinated above, more convex below, falling abruptly at the aperture, and behind it very much contracted and with a prominent isolated bulge; umbilicus at first expanded and grooved, but rapidly terminating in a minute perforation; aperture almost horizontal, ear-shaped, ringent, complicated with teeth; peristome white, thickened, its extremities joined by an elevated, sharp, angular ridge, from which protrude far within the aperture two laminæ (the upper one sharper and more prominent), the connecting terminations of which within the shell resemble a horseshoe; the upper portion of the peristome is slightly reflected and furnished with an oblique entering angle, and the basal portion is callous and reflected; an internal transverse tubercle on the base of the shell. Greater diam. 12, lesser 10; height 5 mill.

Fig. 172.



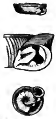
Helix hippocrepis.

Helix hippocrepis, Pfeiffer in Roemer's Texas, 455 (1849); in Zeitsch. f. Mal. 1848, 119; Mon. Hel. Viv. III, 267; in Chemnitz, ed. 2, II, 333, pl. cxxxi, f. 4–6.—Reeve, Con. Icon. no. 1238 (1854).—W. G. Binney, Terr. Moll. IV, 77, pl. lxxviii, f. 19.
Dædalochila (?) hippocrepis, Tryon, Am. Journ. Conch. III, 68, pl. x, f. 42 (1867).

New Braunfels, Texas.

Helix fastigans, L. W. Say.—Shell rimately perforated, plane above, inflated below, with fold-like striæ above, smoother below, somewhat shining, of a russet horn-color, hirsute; spire flattened; whirls six and a half, flattened, the last acutely carinated above, very abruptly deflected at the aperture, scrobiculated, constricted, convex below; aperture very oblique, subreniform, very much contracted, tridentate; within the base of the last whirl is a small, detached, erect, rounded tubercle; peristome white, reflected, its terminations joined by a stout, subtriangular, excavated, deeply entering tooth, the right hand margin with a stout, deeply-seated tooth, the columellar margin with a submarginal, smaller tooth. Greater diam. 10, lesser 9; height about 4 mill.

Fig. 173.



Helix fastigans.

Polygyra fatigiata, Say, N. Harm. Diss. II, 229 (1829); ed. Binney, 37.

Helix fatigiata, Binney in Bost. Journ. Nat. Hist. III, 388 (1840), ex parte (excl. syn. et fig.); Terr. Moll. II, 193 (pars), pl. xxxix, f. 4 (excl. syn.).—Shuttleworth, Bern. Mitt. 1852, 197.—Bland, N. Y. Lyc. VI, 283, pl. ix, f. 17-20 (1858).—W. G. Binney, Terr. Moll. IV, 82.—Pfeiffer, Mon. Hel. Viv. IV, 318.

Helix texasiana, β, Pfeiffer, Mon. Hel. Viv. I, 418; III, 267; in Chemnitz, ed. 2, I, 86, excl. descr., syn., et fig.—Deshayes in Fer. I, 74, excl. descr., syn., et fig.

Helix dorfeuilliana, Deshayes in Fer. I, 73 (excl. syn.), pl. lxix, d, f. 3, not of Lea.

Helicina fastigiata, DeKay, N. Y. Moll. 82 (1843).

Helix fastigans, L. W. Say MS. in Bland, Ann. N. Y. Lyc. VII, 140.

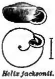
Dædalochila fastigans, Tryon, Am. Journ. Conch. III, 67, pl. x, f. 22, 23, 26 (1867).

Tennessee at Clarkeville and Nashville.

H. fastigans is larger than *troostiana, hazardi*, and *dorfeuilliana;* it is most nearly allied to the first, and though it is connected with the second, is wholly distinct from the last. The parietal tooth is more rectangular than that of *troostiana*, in which it is slightly emarginate near the tip—but much more so in *hazardi*, while the parietal tooth in *dorfeuilliana* is rather quadrate. The teeth on the peristome in *fastigans* and *troostiana* are much alike, as regards form, size, and position—the superior one being the largest—both are larger and transverse in *dorfeuilliana* and in *hazardi*, the inferior one being the largest in the latter. Behind the peristome there are two small pits, showing the situation of the teeth in *fastigans* and *troostiana*, while there is scarcely more than a deep, well-marked constriction in *dorfeuilli-*

ana. *H. troostiana* has a slight groove on the inner side of the last whirl, the absence of which in *fastigans* is noticed by Say, but I scarcely consider that a good specific character. Fresh specimens of *H. fastigans* are, I believe, covered with a very thin epidermis, on which hairs are sparingly scattered—the scars of the hairs may be detected, especially on the last whirl, in denuded shells.

Fig. 174.



Helix jacksonii.

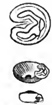
Helix jacksonii, Bland.—Shell narrowly umbilicate, depressed, shining, dark or pale horn-colored, little elevated above, striated, convex beneath, with finer almost obsolete striæ; whirls six, slightly convex, gradually increasing, the last suddenly deflected, contracted and above gibbously inflated behind the aperture; suture impressed; aperture oblique, lunate-circular, with three teeth; peristome thickened, brownish-red, shortly reflected, with the scarcely approaching margins joined by a white, linguiform, bicrural, deeply entering tooth, the basal margin with a strong, oblique, sinuous fold, the right with a deeply seated tooth. Greater diam. 7, lesser 6; height 4 mill.

Helix jacksonii, Bland, Am. Journ. Conch. II, 371, pl. xxi, f. 8 (1866).
Dædalochila jacksonii, Tryon, Am. Journ. Conch. III, 67, pl. x, f. 32, 33, 34 (1867).

Fort Gibson, Indian (Cherokee) Territory.

Most nearly allied to *Helix hazardi*, but readily distinguished by the very different character of the parietal and basal teeth. The species has no internal tubercle.

Fig. 175.



Helix troostiana, enlarged.

Helix troostiana, Lea.—Shell rimately umbilicated, discoidal, slightly convex above, flattened below, obtusely carinated, with separated strong rib-like striæ throughout,[1] hirsute, russet horn-color; spire not much elevated; whirls five and a half, flattened, the last more convex, descending at the aperture, grooved behind the peristome, with a smoother bulge, below plane, widely rimated and ending in a small umbilicus; aperture oblique, subreniform, very much contracted, far within on the base of the outer whirl with a small, detached, erect, rounded tubercle; peristome white, thickened, continuous, ends approached, joined by an excavated, emarginate, somewhat flexuose, slightly entering, tongue-like, heavy callus, the basal margin with a submarginal obtuse stout denticle, right margin with a more deeply seated, broader denticle. Greater diam. 9, lesser 8; height 3 mill.

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[1] Some of the striæ extend over the carina on to the base of the shell without being carried into the umbilicus.

Polygyra troostiana, Lea, Tr. Am. Phil. Soc. VI, 107, pl. xxiv, f. 119; Obs. II, 107 (1839).—Troschel, Arch. f. Nat. 1839, III, 222.

Helix troostiana, Pfeiffer, Mon. Hel. Viv. I, 419, excl. syn. et var.; In Chemnitz, ed. 2, I, 376, pl. lxv, f. 21-24.—Deshayes in Fer. I, 75, pl. lxix, D, f. 4?—Reeve, Con. Icon. no. 706 (1852).—W. G. Binney, Terr. Moll. IV, 88, pl. lxxviii, f. 11.—Bland, Ann. N. Y. Lyc. VI, 288, pl. ix, f. 21-23 (1858).

Helix fatigiata, Binney, Bost. Journ. Nat. Hist. III, 388, pl. xix, f. 3, part, excl. syn.; in Terr. Moll. part, II, 193, pl. xxxix, f. 2.

Helix plicata, Binney (not of Say), Terr. Moll. pl. xxxix, f. 2, not text.

Dædalochila troostiana, Tryon, Am. Journ. Conch. III, 67, pl. x, f. 19, 25 (1867).

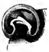
Murfreesboro', Tennessee.

H. troostiana is most nearly allied to *H. fastigans.*

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8671	1	....	W. G. Binney.	Cab. series.

Helix hazardi, Bland.—Shell rimately umbilicated, discoidal, depressed above, convex below, light horn-color, sparingly hirsute, with separated rib-like striæ; spire planulate; whirls five, gradually increasing, the upper ones rounded, smoother, the last convex, plane below, scrobiculated and with an insulated, smooth, prominent bulge behind the peristome, deflected at the aperture; rimation level, at first grooved, showing one and a half whirls, and ending in a narrow umbilicus; aperture subreniform, very oblique, contracted; peristome white, thickened, not reflected, continuous, its terminations approached, joined by a prominent, excavated, heavy, somewhat flexuose, emarginate, tongue-like callus, projecting almost across the aperture; within the columellar margin of the peristome is an erect, blunt, stout denticle (its inner end continued back within the aperture into an erect lamella joining the inner wall) somewhat overlapping and thus partially concealing from view a smaller, more deeply seated, erect, obtuse, stout denticle on the right margin of the peristome; an internal transverse tubercle on the base of the shell. Greater diam. 7, lesser 6; height 3 mill.

Fig. 176.



Helix hazardi, enlarged.

Polygyra plicata, Say, Journ. Acad. Phila. II, 161 (1821); ed. Binney, 21.

Helix fatigiata, Binney in Bost. Journ. Nat. Hist. III, 388 (1840), part (excl. syn. and fig.); in Terr. Moll. part (excl. syn. and fig.).

Helix texasiana, PFEIFFER, Mon. Hel. Viv. I, 418 (excl. syn. and descr.); in CHEMNITZ, I, 85 (excl. syn., descr., and fig.).
Helix dorfeuilliana, DESHAYES in FER. 1, 73 (excl. descr., syn., and fig.).
Helix troostiana, PFEIFFER, Mon. Hel. Viv. IV, 318, part.
Helix hazardi, BLAND, Ann. N. Y. Lyc. VI, 291, pl. ix, f. 27-30 (1858).—PFEIFFER, Mal. Blatt. 1859, 34.—W. G. BINNEY, Terr. Moll. IV, 84, pl. lxxviii, f. 13.
Helix finitima, DESHAYES in FER. ?
Helicina plicata, DEKAY, N. Y. Moll. 82 (1843).
Dædalochila hazardi, TRYON, Am. Journ. Conch. III, 68, pl. x, f. 27-29 (1867).

Alabama (Tuscumbia), Kentucky (near Frankfort), Georgia, and Tennessee (Cumberland Mts.).

This shell may be distinguished from *fastigans* and *troostiana* independently of the absence of the carina, by its smaller size, and more particularly by the different form, relative size, and position of the teeth. In those species the superior tooth on the peristome is transverse, compressed, and larger than the inferior one, from which it is separated by a "remarkable sinus," distinctly visible on looking into the aperture; the inferior tooth is obtuse. Immediately behind the peristome, the position of the teeth is marked by small shallow pits, giving the character to the last whirl designated by Shuttleworth "*scrobiculato-constrictus*," and the striæ run over the whirl up to the peristome. In *H. hazardi*, the two teeth within the peristome are of the same character as the superior one in *fastigans* and *troostiana*; the inferior tooth is however the largest, and so partially conceals the lower margin of the superior one as to obstruct the view into the aperture, and give no appearance of separation "by a remarkable sinus." Both the teeth are more deeply seated than in the other species. The nature of the scrobiculation behind the peristome in *H. hazardi* alone sufficiently distinguishes it from its allies. The space behind the peristome, and between it and the curved pit, showing the seat of the superior tooth, is convex and smooth, the striæ not extending over it.

This species has, in common with *fastigans* and *troostiana*, a thin, brown, but more sparingly hirsute epidermis. I have noticed the tubercle within the last whirl, near the aperture, in *fastigans* and *troostiana*, but no such process exists in the species now under consideration. In *H. hazardi*, the inferior tooth of the peristome, at its inner end, is continued back within the aperture, forming a white erect lamella on the floor of the whirl, parallel with, and leaving a narrow sinus between it and the inner wall, to which it is joined at its extremity, about two and a half mill. from the edge of the peristome. The position of this lamella can be seen through the shell.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8672	1	....	W. G. Binney.	Cab. series.
8539	3	....	Lieut. Kurtz.	......

Helix oppilata, Moricand.—Shell umbilicated, depressed, delicately striate, subpellucid, light horn-color or white; spire scarcely elevated; whirls five, rather convex, gradually increasing, the last deflected at the aperture, inflated below, constricted behind the peristome; umbilicus at first widened, then narrow, pervious; aperture diagonal, lunately-circular, ringent; peristome briefly reflected, its terminations joined by a tongue-shaped, entering, two-forked callus, the right margin subequally bidentate. Greater diameter 7, lesser 6; height 3 mill.

Fig. 177.

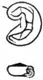
Helix oppilata.

Helix oppilata, Moricand, Test. Noviss. I, 8.—Pfeiffer, Mon. Hel. Viv. III, 264; IV, 314.

The specimen figured is not American, nor have I known of any having been found out of Yucatan, but Pfeiffer on Shuttleworth's authority refers to Florida a var. β with a somewhat more elevated spire, five and a half whirls and 8⅔ mill. in the greater diameter.

Helix dorfeuilliana, Lea.—Shell rimately umbilicated, discoidal, slightly convex above, flattened below, light horn-colored, striated, below smoother and with minute revolving lines; spire not much elevated; whirls six, flattened, gradually increasing, the last more convex, inflated below, constricted behind the peristome, descending at the aperture, below with a grooved rimation of one and a half whirls, ending in a very small umbilicus; aperture oblique, subreniform, contracted, far within furnished with a deeply seated, erect tubercle on the base of the last whirl; peristome white, very much thickened, not reflected, continuous, its terminations but slightly approached, joined by a heavy, excavated, subquadrate callus projecting across the aperture, the columellar margin with a deeply seated, transverse, somewhat pointed denticle, distinctly separated from a broader, equally deeply-seated

Fig. 178.



Helix dorfeuilliana, enlarged.

obtuse denticle on the right margin. Greater diam. 8, lesser 7; height 3½ mill.

Polygyra dorfeuilliana, LEA, Trans. Am. Phil. Soc. VI, 107, pl. xxiv, f. 118; Obs. II, 107 (1839); TROSCHEL'S Arch. f. Nat. 1839, II, 222.
Helix dorfeuilliana, BLAND, Ann. N. Y. Lyc. (1858), VI, 294, pl. ix, f. 24–26.—W. G. BINNEY, Terr. Moll. IV, 86, pl. lxxviii, f. 2, 14, not of PFEIFFER, DESHAYES, CHEMNITZ, REEVE.
Helix fatigiata, BINNEY, Bost. Journ. Nat. Hist. III, 388 (1840); Terr. Moll. II, 193 (excl. descr., syn., and fig.).
Helix troostiana, var.? PFEIFFER, Mon. Hel. Viv. III, 318, no descr.
Dædalochila dorfeuilliana, TRYON, Am. Journ. Conch. III, 66, pl. x, f. 20, 21 (1867).

Washington County, Texas; Washita Springs, Ark.; Coosa River, Ala.; Kentucky, opposite Cincinnati. It thus appears much more widely distributed than the allied species.

H. dorfeuilliana differs materially in its characters from the allied species; the striæ on the upper surface are not so well defined as in *troostiana*, but more so than in *hazardi*, while the base is more smooth than in either of them, having only very delicate striæ, with microscopic impressed spiral lines. The parietal tooth is quadrate—the two teeth on the peristome are more nearly of the same size and form than in *fastigans* and *troostiana*. In this species the inferior tooth is transverse, and in some specimens broader than the superior one, but has a somewhat pointed apex; both are very nearly equally deeply seated, but so far apart as to allow a view between them into the aperture, leaving, as Mr. Lea expresses it, "to appearance three nearly square apertures." Say would have described the two teeth as "separated by a remarkable sinus." The peristome of this is more thickened and less reflected than in the other species; behind it is deeply constricted, without any appearance of pits showing the position of the teeth within.

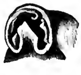
There is a form of *H. dorfeuilliana* which differs from the type in that the superior tooth on the peristome is larger and more deeply seated than the inferior one, and that the latter, though more developed, is much of the same form as the inferior tooth in *fastigans* and *troostiana*. The parietal tooth partakes of the general character of that in Lea's type of *dorfeuilliana*, but its lower and terminal margins project more perpendicularly from the parietal wall. The umbilical perforation is also larger, and the base of the shell is more smooth. The following are the measurements of a large specimen: Greater diam. 9, lesser 8; height 4 mill. I am much inclined to consider this a distinct species, but remark upon it, as I believe it is more commonly found in cabinets under the name of *dorfeuilliana*, than the shell described by Lea.

H. dorfeuilliana, and also the shell last considered, have a tubercle within the aperture very similar to that in *fastigans* and *troostiana*.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8826	2	Texas.	W. O. Binney.	Cab. series.
8957		Hot Spr., Ark.	Dr. B. Powell.	......

Helix acutedentata, W. G. Binney.—Shell rimately umbilicated, discoidal, equally flattened above and below, white, smooth, shining; spire very short, scarcely elevated, sunken, the apex about on a level with the top of the last whirl; whirls six, the upper five gradually increasing, the last very large, inflated, descending towards the aperture, below inflated, rimate, showing only one and a half volutions, and with a small deep umbilicus; aperture small, very oblique, subreniform; peristome white, thickened, acute, subreflected in its whole circuit, its ends approached, joined and made continuous by a heavy white, emarginate, excavated, prominent callus on the parietal wall, extending almost across the aperture, its columellar margin with one or two short, perpendicular, marginal denticles; within the right hand margin of the aperture are two horizontal lamina-like denticles, one obtuse, the upper raised at its end into an acute, curved, long, hook-like point; behind the peristome on the outer surface of the last whirl the position of these laminæ is marked by two pits, between which the shell is pinched into a sharp ridge joining the peristome. Greater diam. 14, lesser 11; height 4 mill.

Fig. 179.



Helix acutedentata.

Helix acutedentata, W. G. Binney, Proc. Acad. Nat. Sci. Philad. 1857, 183; Terr. Moll. U. S. IV, 23, pl. lxxvi, f. 1.—Pfeiffer, Mon. Hel. Viv. IV, 351.

Helix loisa, W. G. Binney, Proc. Acad. Nat. Sci. Philad. 1857, 183; Terr. Moll. U. S. IV, 23, pl. lxxvi, f. 2.—Pfeiffer, Mon. Hel. Viv. IV, 351.

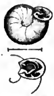
Dædalochila acutedentata, Tryon, Am. Journ. Conch. III, 65, pl. x, f. 11, 13 (1867).

Dædalochila loisa, Tryon, *l. c.* f. 12, 14.

Mazatlan and Guaymas.

Helix ariadnæ, Pfr.—Shell with an arcuate rimation, terminating in a minute oblique perforation, depressed, subdiscoidal, rather solid, nearly transparent, bluish-white, with scarcely perceptible wrinkles on the upper surface; spire flattened; whirls five, separated by a distinct suture, flattened, the last one suddenly falling towards the aperture, very much contracted and pinched behind the peristome, more convex and smoother below; there is a deeply chiselled, arcuated, umbilical rimation, the umbilical region is also channelled; aperture small, extremely complicated with teeth, very oblique, lunately circular, ringent; peristome white, slightly reflected, its terminations approaching each other and joined by two flexuose, elevated, acute laminæ, converging to a point far within the aperture; the basal margin of the peristome is also furnished with two stout, entering, converging marginal folds, the right margin of the peristome has a more delicate, deeply seated, elongated lamina, running almost parallel with the peristome. Greater diam. 12, lesser 10; height 5 mill.

Fig. 180.



Helix ariadnæ.

Helix ariadnæ, Pfeiffer in Zeitsch. f. Mal. 1848, 120; Mon. Hel. Viv. III, 266; in Chemnitz, ed. 2, 1, 372, pl. lxv, f. 19–21 (1846).—W. G. Binney, Terr. Moll. IV, 76, pl. lxxviii, f. 1, 3, 4.

Helix couchiana, Lea, Proc. Acad. Nat. Sci. Philad. 1857, 102; Journ.—; Obs. XI, 139, pl. xxiv, f. 112.

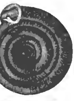
Dædalochila ariadnæ, Tryon, Am. Journ. Conch. III, 66, pl. x, f. 15, 16, 18 (1867).

In the region of the Rio Grande, both in Texas and Tamaulipas.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8648	7	Tamaulipas, M.	Lieut. Couch.	Cab. series.

Helix septemvolva, Say.—Shell broadly umbilicated, subcarinated, discoidal, russet horn-color, with stout striæ above, smooth below; plane above with seven (sometimes eight and a half) or less flattened whirls; equally plane below, with three and a half full, more convex whirls on a level, then ending in a deep, pervious umbilicus, the penultimate somewhat overlapped by the last, the antepenultimate much the largest; aperture very oblique, remote from the axis, subreniform, constricted behind the peristome; peristome thickened, bluntly reflected, continuous, its terminations joined by an elevated, heavy, tooth-like triangular fold. Greater diam. 15, lesser 13; height 4 mill.

Fig. 181.



Helix septemvolva, enlarged.

Polygyra septemvolva, SAY, Journ. Acad. Nat. Sci. Philad. I, 278 (1818); Nich. Encycl. 3d ed. (1819); BINNEY'S ed. 11.—TRYON, Am. Journ. Conch. III, 159, pl. xi, f. 22 (1867).

Helix septemvolva, BINNEY, Terr. Moll. U. S. II, 196 (part), pl. xxxviii, outer figs.; pl. xxix, f. 1.—DEKAY, N. Y. Moll. 47 (1843).—BLAND, Ann. N. Y. Lyc. VII, 131, f. on p. 136.—W. G. BINNEY, Terr. Moll. IV, 89; part.

? *Helix volvoxis*, PFEIFFER, see below.

St. Augustine, Florida.

Animal (see p. 86) brownish, eye-peduncles darker, very long and slender, eyes black; foot narrow, thin, semi-transparent, receiving its color, in some degree, from the substance on which it is placed, not projecting behind the shell when in motion; length less than twice the breadth of the shell, which it carries nearly horizontal.

The shell described and figured above, which is, no doubt, the form called *septemvolva* by Say, is only found, to my knowledge, at St. Augustine, Florida. There are, however, associating with it there, and also found at many other points on the Georgia, Florida, and Alabama coasts, other forms which appear to be varieties of it. It may be said, therefore, that it varies in being occasionally a little convex, more or less carinate, and in exhibiting a greater or less number of full volutions on the base. The lower surface is sometimes marked with the alternate white and brown flammules which characterize *H. carpenteriana.*

The reflected peristome in this shell seems to be formed at various periods of growth, thus creating a greater diversity of size in the apparently mature shell than exists in any other species. From the nucleus until the accomplishment of five full whirls, each whirl on the base is curved a little lower than that which precedes it; and up to this time, consequently, the umbilicus is deep and gradually expanding, exhibiting, when carefully examined, all the volutions. Up to this period, also, the spire is almost always prominent. After five whirls are completed, the succeeding ones usually follow in the same horizontal plane, and give a discoidal character to the shell. It is manifest, therefore, that specimens in each of these stages must present considerable differences; and, accordingly, the small, delicate shell, having a slightly convex spire of five whirls, a deep umbilicus, and a transverse diameter of only one-eighth of an inch,

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forms a beautiful variety, and has been thought to be a distinct species.

The form known as *H. volvoxis* is found on the Atlantic coast of Florida and Georgia. It is thus described by Pfeiffer. The synonymy is also given in full. I believe it to be a variety of *H. septemvolva* :—

Shell umbilicated, orbicularly convex, thin, reddish horn-colored, pellucid, with regular rib-like striæ; spire very short, convex; whirls seven, convex, regularly increasing, the last larger above than the rest, angular, below the angle inflated, striated and shining; umbilicus large, regular, in which the whirls regularly decrease, excepting the last, which is very broad; aperture rather large, kidney-shaped; peristome thickened within, reflected, its terminations joined by a short, triangular, tooth-like callus. Greater diam. 9, lessar 8; height 4 mill.

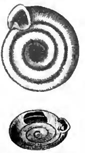
Helix volvoxis, PARRAYSS in PFEIFFER, Symb. III, 80; Mon. Hel. Viv. I, 409; in CHEMNITZ, ed. 2, I, 379 (1846), pl. lxvi, f. 4–6 (1849).—REEVE, Con. Icon. no. 1237 (1854).—W. G. BINNEY, Terr. Moll. U. S. IV, 92, pl. lxxviii, f. 17.—BLAND, Ann. N. Y. Lyc. VII, 135.

Polygyra volvoxis, TRYON, Am. Journ. Conch. III, 159, pl. xi, f. 25 (1867).

Cat. No.	No. of Sp	Locality.	From whom received.	Remarks.
8639	4	St Augustine, Fla.	O. M. Dorman.	......
8641	11	St. Simon's Island, Ga.	J. Postell.	......
8775	2	Key West.	W. G. Binney.	(*volvoxis.*)

Helix cereolus, MUHLFELDT.—Shell broadly umbilicated, subcarinated, discoidal, white, scarcely convex and with rib-like striæ above, smooth and plana below; whirls seven or eight, gradually increasing, the last subcarinated, briefly deflected at the aperture, constricted behind the peristome; below three full whirls revolving on the same plane, the balance visible in the broad, pervious umbilicus, the penultimate somewhat lapped over by the last, the antepenultimate the most swollen; aperture remote from the axis, subreniform; peristome white, thickened, acutely reflected, somewhat angular at the carination of the last whirl, continuous, its terminations joined by triangular, elevated, acutely-pointed callus; on the parietal side of the inner fourth of the last, and running round rather obliquely within from two-thirds to three-fourths of the penultimate whirl, thus revolving nearly once round the shell, is a thread-like, elevated, white internal lamina. Greater diam. 14, lesser 12½; height 3½ mill.

Fig. 182.



Helix cereolus, enlarged.

Helix cereolus, Muhlfeldt, Berlin Mag. VIII (1816), 41, pl. ii, f. 18.—Pfeiffer, Mon. Hel. Viv. I, 408; ? in Chemnitz, ed. 2, I, 378, pl. lxvi, f. 1–3.—? Reeve, Con. Icon. 698.—Bland, Ann. N. Y. Lyc. VII, 136, f. 2.—W. G. Binney, Terr. Moll. IV, 80, part, pl. lxxvii, f. 23.

Helix septemvolva, ? Férussac, Hist. pl. ii, f. 6.—? Wood, Index Test. Suppl. vii, f. 14; ed. Hanley, 226, f. 14.—? Sowerby, Conch. Man. ed. 2, f. 275.—Binney, Bost. Journ. Nat. Hist. III, 391, pl. xix, f. 4 (1840); Terr. Moll. II, 196, pl. xxxviii, central line.—Deshayes in Fér. Hist. 5.

Helix planorbula, Lamarck ? An. s. Vert. VI, 89.—? Deshayes in Lam. VIII, 67; Encycl. Méth. II, 208 (1830).—? Delessert, Rec. pl. xxvi, f. 3 (1841).—? Chenu, Illust. Conch. pl. xii, f. 3.

Helix cereolus, var. *laminifera*, W. G. Binney, Proc. Acad. Nat. Sci. Phila. 1858, 200, no descr.

Polygyra cereolus, Tryon, Am. Journ. Conch. III, 158, pl. xi, f. 19–21 (1867).

Indian Key and Indian River, Florida.

The umbilical opening, in specimens of about equal size, is only half the width of that in *septemvolva;* the last whirl is wider, especially towards its termination at the aperture, more inflated, and rather less acutely carinated. The aperture is more orbicular, more contracted, and the peristome more expanded and acutely reflected, and at its junction below with its pillar lip more closely appressed to the last whirl.

Fig. 182 represents a specimen broken, so as to show the internal lamina.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8640	1	Florida	W. G. Binney.	Cab. series.
8820	100+	Indian Key, Fla.	G. Wurdemann.	......

Helix carpenteriana, Bland.—Shell umbilicate, orbicular, horn-colored or pale rufous, above flat, obliquely and acutely ribbed, beneath convex, slightly striated, shining, often ornamented with indistinct white spots; suture deeply impressed; whirls five and a half to six and a half, the last subangular at the periphery, shortly but suddenly deflected at the aperture, gibbous, scrobiculate, constricted, tumid behind the aperture, and ribbed, base dilated, with a white internal thread-like lamina[1] on the columellar wall near the point of attachment of the aperture; aperture

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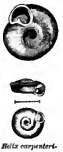
[1] As in *H. cereolus*, see Fig. 182, p. 106.

Fig. 183.



Helix carpenteriana, enlarged.

very oblique, lunate; peristome callous within, thickened, little reflected, the margins joined by a triangular dentiform lamella. Greater diam. 10, lesser 9; height 4 mill.

Helix microdonta, Pfeiffer, Mon. Hel. Viv. 499, ex parte? (1848).—W. G. Binney. Terr. Moll. IV, 91, pl. lxxviii, f. 28, excl. fig.
Helix carpenteriana, Bland, Ann. N. Y. Lyc. VII, 137.
Polygyra carpenteriana, Tryon, Am. Journ. Conch. III, 159, pl. xi, f. 24, not 23 (1867).

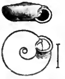
Florida, from St. Augustine through the Keys.

This species has been hitherto named *H. microdonta* in American cabinets. It is readily distinguished from all the other species of the group by its strong acute rib-like striæ, and the peculiarity of the outer whirl. About the last third of it, behind the aperture, is ribbed and tumid; the whirl is then rather abruptly contracted, becoming narrower above, and flattened and slightly striated beneath, but again, as it passes towards and beneath the aperture, dilated and convex. This change of form gives to the last whirl a distorted appearance. The internal lamina is on the columellar wall of the contracted and flattened portion of the last whirl, and runs obliquely, in the direction of the aperture, attaining a length in a large specimen of about 6 mill. The character of the aperture is most like that of *H. cereolus*, but in that species the last whirl has none of the peculiarities above described. The internal lamina is found in a majority of specimens, but not in all; it can generally be seen through the outer wall of the shell.

The upper figure is engraved directly from a photograph on wood.

Cat. No	No. of Sp.	Locality.	From whom received.	Remarks.
7938	45	Key Biscayne, Fla.	G. Wurdemann.	......
8563	9	" "	"	Cab. series.

Fig. 184.



Helix febigeri.

Helix febigeri, Bland.—Shell umbilicate, orbicular, flat, thin, shining, pale or reddish horn-colored, with rather distant rib-like striæ above, finely striated beneath; spire almost level; suture deep; whirls five and a half to six, rather convex, regularly increasing, the last angular at the periphery, inflated below; umbilicus funnel-shaped; aperture oblique, kidney-shaped; peristome thickened, little reflected, the margins joined by a strong triangular callus. Greater diam. 8½, lesser 7½; height 3½ mill.

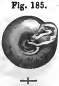
Helix febigeri, Bland, Am. Journ. Conch. II, 373, pl. xxi, f. 10 (1866).
Polygyra febigeri, Tryon, Am. Journ. Conch. III, 160, pl. x, f. 30, 33 (1867).

New Orleans.

This species certainly differs from *H. cereolus*, Muhl., *H. septemvolva*, Say, *H. volvoxis*, Parr., and *H. carpenteriana*, Bld., the four species of the same group hitherto found on the North American continent. Compared with *H. paludosa*, Pfr., of Cuba, the rib-like striæ are more regular and prominent, it is more decidedly angular at the periphery, and the form and armature of the aperture are different. In *H. febigeri* there is no such excavation below the angle of the periphery as prevails, more or less, in the other above-named continental species. In this respect, and in the form of the aperture, *H. febigeri* appears to be most nearly allied to *H. microdonta*, Desh., of Bermuda and New Providence, but it is more coarsely striated, and the last whirl is more inflated below.

Helix pustula, Fer.—Shell umbilicated, orbicularly depressed, minutely striated, reddish or pale horn-color, hirsute; spire scarcely elevated; whirls four and a half, flattened, gradually increasing, the last more convex below, deflected at the aperture, constricted behind the peristome; umbilicus broad, pervious, with a deep groove marked within the shell by an internal, revolving ridge-like lamella, branching from a stout transverse, internal tubercle; aperture very oblique, narrow, sinuously lunate; peristome sinuous, white, thickened, acute, somewhat reflected, its terminations joined by a two-forked, elevated, acutely-pointed lamina, the basal margin with two approximated acute denticles, the columellar termination entering and somewhat covering the umbilicus. Greater diam. 5, lesser 4; height 2½ mill.

Fig. 185.



Helix pustula.

Helix pustula, Ferussac, Hist. pl. 1, f. 1.—Deshayes in Fer. I, 78, t. I, f. 1.—Pfeiffer, Symb. III, 81; Mon. I, 422; IV, 268, excl. β; in Chemnitz, ed. 2, I, 376, pl. lxv, f. 18–20 (1846).—Reeve, Con. Icon. 721 (1852).—Bland, Ann. N. Y. Lyc. VI, 346, f. 1 (1858).—W. G. Binney, Terr. Moll. IV, 94, pl. lxxvii, f. 12.—Not of Binney.
Dædalochila pustula, Tryon, Am. Journ. Conch. III, 62, pl. x, f. 6, 17 (1867).

South Carolina, Georgia, Florida, Texas.

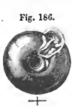
The groove within the umbilicus is a very marked feature in Ferussac's species, and though not referred to in his description, is distinctly shown in one of the figures; it is entirely wanting in *H. leporina*, and also in *H. pustuloides*. This groove is not only an external character, but its presence modifies the internal structure of the shell. On opening the base of the last whirl immediately behind the aperture, a strongly developed transverse tubercle is seen within, from which a strong ridge-like lamella runs round the umbilical opening, corresponding in extent with the groove. This tubercle, and the extension of it, are entirely disconnected by a sinus or channel from the floor of the penult whirl.

The hirsute character of this species is not generally alluded to by authors. The outer edge of the peristome in specimens from St. Augustine, is of a deep rose color.

Cat. No.	No. of Sp	Locality.	From whom received	Remarks.
8642	4	St. Simon's Is., Ga.	Dr. J. Lewis.	Cab. series.

Helix pustuloides, Bland.—Shell widely umbilicate, planorboid, thin, rufous or pale horn-colored, delicately striated, with thin sparingly hirsute epidermis; spire scarcely elevated; whirls four to four and a half, slightly convex, gradually increasing, the last sub-angular at the periphery, at the aperture gibbous, constricted, suddenly deflected, beneath devious; suture rather deeply impressed; umbilicus wide, equal to one-third of the larger diameter of the shell, showing all, but especially the penult whirl; aperture with an internal fulcrum-like process on the base of the shell, oblique, crescentic, with an erect, oblique, white, parietal lamelliform tooth, joined to the upper angle of the aperture by a slightly arcuate, filiform callus; peristome reflected, with margins approaching, and having two dentiform lobes separated by a deep fissure. Greater diam. 5½, lesser 4½; height 2½ mill.

Fig. 186.



Helix pustuloides.

Helix pustula, Binney, Terr. Moll. II, 201, pl. xxxix, f. 3, not of Ferussac.
Helix pustuloides, Bland, Ann. N. Y. Lyc. VI, 350, f. 3 (1858).—W. G. Binney, Terr. Moll. IV, 93.
Dædalochila pustuloides, Tryon, Am. Journ. Conch. III, 61, pl. x, f. 2, 3 (1867).

Georgia and Alabama.

H. pustuloides is intermediate in size between *H. pustula* and *H. leporina*—is less globose than the former, and more sparingly hirsute. It differs widely from both in the character of the umbilicus; the aperture is much like that of *pustula*, but more narrow than that of *leporina*. The inferior tooth on the peristome is more developed laterally than in *H. pustula*—indeed it has a somewhat bifid appearance, in which respect it is more allied to *H. leporina*.

The *fulcrum* in *H. pustuloides* is of the same nature as that in *H. leporina*, but less developed, and with the outer edge entire.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
7937	4	North Georgia.	A. Gerhardt.	......
8589	4	" "	"	Cab. series.

Helix leporina, Gould.—Shell with a partially covered umbilicus, depressed, orbicular, thin, reddish horn-color, delicately striated, and, when fresh, having a delicate down on its surface; spire depressed, composed of five slightly convex whirls, the last of which is obtusely angular at its upper portion; base convex, excavated at the umbilical region, with a minute, partially covered umbilicus; aperture oblique lunate; peristome incumbent, rose-colored, reflexed, bearing on its dilated basal edge two expanded teeth separated by a deep, narrow fissure, its terminations joined by a quadrate, erect, oblique lamella, whose upper edge is joined to the upper angle of the aperture by a thread-like callus; an internal, fulcrum-like tubercle, with uneven outer edge, on the base of the shell. Greater diam. 6, lesser 5½; height 3 mill.

Fig. 187.

Helix leporina.

Helix leporina, Gould, Proc. Bost. Soc. III, 39 (1848); in Terr. Moll. II, 199, pl. xi, a, f. 1.—Reeve, Con. Icon. 722 (1852).—Bland, Ann. N. Y. Lyc. VI, 348 (1858).—W. G. Binney, T. M. IV, 92.—Pfeiffer, Mon. Hel. Viv. IV, 320, no descr.

Helix pustula, Pfeiffer, Mon. Hel. Viv. I, 70, descr.: var. β; III, 268, not of Ferussac.

Dædalochila leporina, Tryon, Am. Journ. Conch. III, 61, pl. x, f. 1, 4 (1867).

Indiana, Illinois, Arkansas, Mississippi, Georgia.

H. leporina is larger than *H. pustula*, less elevated, the whirls are less convex, the incremental striæ less numerous and distinct, and the aperture is wider. The umbilicus is more nearly covered by the peristome, and is without the groove which prevails in *pustula*. Within and near the aperture, there is what may be called the *fulcrum*, extending from the floor of the last to that of the penultimate whirl, and approaching in character to, but less strongly developed, than that in *H. monodon*. The outer edge of this *fulcrum* is uneven—in one specimen somewhat denticulated.

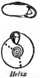
Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8643	1	Illinois.	R. Kennicott.	Cab. series.

Subgenus POLYGYRELLA, Bland.

Shell widely umbilicated, discoidal, ribbed above, smoother below; whirls 7–8, gradually increasing, the last deflected above, furnished within with two rows of three teeth; base flattened, umbilicus of equal size to the apex; aperture subvertical, oblique, lunate-oval; peristome white, simple, much thickened within, margins joined by a white, pliciform, elevated, triangular tooth.

Helix polygyrella, Bland.—Shell widely umbilicate, discoidal, flat, shining, translucent, yellowish horn-colored, ribbed above, the ribs obsolete near the aperture, base rather smooth; spire scarcely elevated; whirls seven to eight, somewhat convex, gradually increasing, the last slightly deflexed above, armed within with two rows of three teeth, seen through the outer wall; umbilicus pervious, of equal size to the apex; aperture subvertical, oblique, lunate-oval; peristome depressed above, white, simple, much thickened within, the margins joined by a white, pliciform elevated, triangular tooth. Greater diam. 11½, lesser 10½; height 5 mill.

Fig. 188.



Helix polygyrella.

Helix polygyrella, Bland & Cooper, Ann. N. Y. Lyc. VII, 365, pl. iv, f. 13–15 (1861).

Polygyra polygyrella, Tryon, Am. Journ. Conch. III, 160, pl. xi, f. 26 (1867).

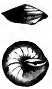
Common on the Cœur d'Alêne Mountains, especially on their eastern slope, in spruce forests.

Subgenus STENOTREMA, Raf.

Shell with the perforation covered, lenticular or globosely depressed, hairy; whirls 4½–6, the last anteriorly gibbous, shortly deflexed, tumid below; spire somewhat elevated; peristome with a white, thickened margin, briefly reflexed above, somewhat constricted in its basal portion, usually sinuous and dentate, furnished with an internal transverse tubercle on the floor of the base of the last whirl.

Helix spinosa, Lea.—Shell imperforate, lenticular, with the upper surface much flattened, acutely carinated; epidermis dark chestnut color, with minute, hair-like processes lying flat upon the whirls in the direction of their lines of growth, striate; whirls six, of nearly uniform width, and decreasing very gradually from the aperture to the spire; suture distinct, slightly raised; aperture very narrow; peristome yellowish-white, near its junction with the body-whirl thickened, angulated, and slightly reflected, with a median cleft; parietal wall with a long, yellowish, narrow, projecting tooth, extending from the umbilical axis to the angle of the peristome, and parallel with its thickened edge; base convex, with the umbilical region slightly indented; within the shell, springing from the axis, is a transverse, curved, white tubercle. Greatest diam. 14, lesser 13; height 6 mill.

Fig. 189.



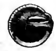
Helix spinosa.

Carocolla spinosa, Lea, Am. Phil. Trans. IV, 104, pl. xv, f. 35; Obs. I, 114 (1834).

Helix spinosa, Binney, Bost. Journ. Nat. Hist. III, 367, pl. xi, f. 2 (1840); Terr. Moll. II, 153, pl. xliv, f. 1, excl. syn.—Pfeiffer, Mon. Hel. Viv. I, 421; in Chemnitz, ed. 2, I, 375, pl. lxv, f. 15–17 (1849).—DeKay, N. Y. Moll. 47, pl. v, f. 114 (1843).—Reeve, Con. Icon. 685 (1852).—W. G. Binney, Terr. Moll. IV, 65.

Stenotrema spinosa, Tryon, Am. Journ. Conch. III, 58, pl. ix, f. 26, 28, 29 (1867).

Fig. 190.



Helix spinosa.

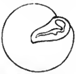
Alabama, Georgia, Tennessee.

Fig. 190 shows the internal tubercle.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8635 5996	3	Alabama. Eutaw, Ala.	W. G. Binney.	Cab. series. ......

Helix labrosa, Bland.—Shell imperforate, lenticular, carinated, the carina somewhat obsolete behind the aperture, solid, with curved striæ, dark-brown colored beneath the epidermis, epidermis thin, with prostrate hairs; spire convex-conoid, obtuse; whirls five and a half, rather convex, the last deflexed, constricted, the base inflated, and sculptured beneath the epidermis with numerous impressed spiral lines; the aperture very oblique, narrowly ear-shaped, contracted by a strong linguiform tooth extending along the entire parietal wall; peristome callous, somewhat reflected, the margin joined by a sinuous callus, the basal margin thickened, inwardly much dilated, with a deep and wide notch in the middle; with an internal transverse tubercle on the base of the shell. Greater diam. 12½, lesser 10; height 6½ mill.

Fig. 191.



Helix labrosa, enlarged.

Helix labrosa, Bland, Ann. N. Y. Lyc. VII, 430, pl. iv, f. 19 (1861).

Stenotrema labrosa, Tryon, Am. Journ. Conch. III, 59, pl. ix, f. 25 (1867).

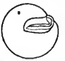
Arkansas, Alabama, Tennessee.

The thickened and reflected peristome, and deep wide notch, sufficiently distinguish *H. labrosa* from *H. edgariana*. The notch in the latter, situated in the centre of the aperture as in *H. stenotrema*, is in a measure obsolete, but in *H. labrosa* it is strongly developed, and nearer to the outer edge of the peristome, as in *H. hirsuta*. The form of the parietal tooth of this species is like that of *H. hirsuta*, while *H. edgariana* is in that particular more like *H. stenotrema*. *H. edgariana*, in fact, connects *H. stenotrema* with *H. spinosa*, but *H. labrosa* is rather allied to *H. hirsuta*, and in the character of the peristome to *H. maxillata*.

Cat. No	No. of Sp	Locality.	From whom received.	Remarks.
8961		Hot Springs, Ark.	Dr. B. Powell.	Teste Bland.

Helix edgariana, Lea.—Shell imperforate, lenticular, carinated, solid, arcuately striate, under the epidermis yellowish flesh-color, with distant, short, prostrate hairs; spire convex conoid, rather obtuse; whirls five, flattened, the last anteriorly deflected, subconstricted; aperture very oblique, most narrowly ear-shaped, narrowed by a stout, tongue-shaped, arcuately entering tooth on the full length of the parietal wall; peristome subcontinuous, its upper margin subsimple, its basal margin much dilated inwardly, with a slight median cleft; far within on the base of the shell is a stout, transverse tubercle. Greater diam. 9, lesser 8; height 5 mill.

Fig. 192.



Helix edgariana, enlarged.

Caracolla edgariana, Lea, Trans. Am. Phil. Soc. IX, 2; Obs. IV, 2 (1843); Proc. II, 31 (1841); in Troschel's Arch. f. Nat. 1843, II, 124.

Helix edgariana, Pfeiffer, Mon. Hel. Viv. I, 425.—Binney, Terr. Moll. II, 155, pl. xliv, f. 2.—Reeve, Con. Icon. 703.—W. G. Binney, Terr. Moll. IV, 65.—Bland, Ann. N. Y. Lyc. VII, 428, pl. iv, f. 18.

Stenotrema edgariana, Tryon, Am. Journ. Conch. III, 59, pl. ix, f. 27 (1867).

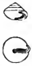
Tennessee, Alabama, Arkansas.

H. edgariana differs from *H. spinosa* in the following particulars: it is smaller, more elevated, and more convex beneath. In form the parietal tooth is most like that of *H. stenotrema*, while that of *H. spinosa* is more nearly allied to that usually prevailing in *H. hirsuta*. The whirls of *H. spinosa* are flattened and exserted, the carinated edges of all being seen, but in *H. edgariana* the upper whirls are rather convex, and defined by a well-marked suture. Traces of hairs rarely exist at the base of *H. spinosa*, and no scars indicating their presence are visible on dead or denuded shells, whereas in *H. edgariana* there are distant, short, prostrate hairs, with strongly marked scars on the shell. Fresh or young specimens have no doubt the cilia, as in *H. spinosa*.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8634	1	....	W. O. Binney.	Cab series.

Helix edvardsi, Bland.—Shell imperforate, lenticular, carinate, the carina obsolete near the aperture, rather thin, beneath the epidermis pale brown; the epidermis dark chestnut-color, with numerous minute curved hair-like processes lying flat upon, and attached to the epidermidal surface of the upper whirls in the direction of the incremental striæ, the epidermis at the base covered with acute, raised, transverse tubercles, most numerous, and having erect bristles near the aperture; spire convex-conoid; whirls five, flattened, gradually increasing, the last gibbous above, suddenly but slightly deflected; apex minutely granulate; base convex, little indented in the umbilical region, and with impressed spiral lines beneath the epidermis; suture deeply impressed; aperture oblique, transverse, auriform, narrowed by a slender slightly arcuate, lamelliform parietal tooth extending across from the umbilical axis, and terminating with a short angular deflection within the aperture; upper margin of the peristome acute, scarcely reflected, and partially appressed to the body-whirl, with a tooth-like callus within, having an almost obsolete notch in the centre; with an internal transverse tubercle on the base of shell. Greater diam. 9, lesser 8; height 5 mill.

Fig. 193.



Helix edvardsi.

Helix edvardsi, Bland, Ann. N. Y. Lyc. VI, 277, pl. ix, f. 14–16 (1859).—W. G. Binney, Terr. Moll. IV, 63, pl. lxxix, f. 7–9.—Pfeiffer, Mal. Blatt. 1859, 13.

Stenotrema edwardsi, Tryon, Am. Journ. Conch. III, 59, pl. ix, f. 34 (1867).

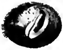
Mountains of Fayette or Green Briar Co., Virginia.

This species is allied to or rather intermediate between *H. barbigera* and *H. hirsuta*, Say—the former connecting *H. spinosa* with *H. fraterna*. It is smaller, more elevated, less acutely carinated, and readily distinguished from *H. barbigera* by the partially appressed, notched peristome, and the different character of the epidermis. In *H. barbigera* the attached hair-like epidermidal processes are produced, at the sutures and carina, into cilia which are entirely wanting in this species. The same processes, though less numerous, and sometimes almost obsolete, are observable at the base of the former, while in the latter, the basal epidermis approaches in character to that of *H. palliata*. The deep characteristic notch in *H. hirsuta* is considerably less developed in *H. edvardsi*, and the callus which connects the parietal tooth with the upper margin of the peristome in the former, does not exist in the latter. In the general character of the peristome the species under consideration resembles *H. hirsuta*, while *H. barbigera* is in that particular more appropriately compared with *H. fraterna*, Say.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8827	1	Kenawha, Va.	T. Bland.	......

Helix barbigera, Redfield.—Shell imperforate, sharply carinate, rather thin, dark horn-colored or brown; the upper surface has the epidermis raised into acute striæ, which at the suture and carina are produced into short cilia or bristles; these epidermidal striæ are sometimes seen beneath, but less distinctly, being often obsolete in the mature shell; basal surface convex, but indented in the umbilical region; spire slightly convex; whirls five and a half, rather flat, last one suddenly but slightly deflected; aperture very oblique, transverse, ear-shaped, narrowed by a rather slender, tongue-shaped tooth, which extends nearly across the whole width of the aperture; peristome callous, margins slightly but distinctly reflected, and thickened within, basal margin

Fig. 194.



Helix barbigera, enlarged.[1]

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[1] The figure was photographed on wood.

slightly arcuate, but entire; with an internal transverse tubercle at the base of the shell. Greater diam. 10, lesser 9; height 6 mill.

Helix barbigera, Redfield, Ann. N. Y. Lyc. VI, 171, pl. ix, f. 4, 5, 7 (1856).—Gould in Terr. Moll. III, 21.—W. G. Binney, Terr. Moll. IV, 63, pl. lxxvii, f. 2.—Pfeiffer, Mon. Hel. Viv. IV, 348.

Stenotrema barbigera, Tryon, Am. Journ. Conch. III, 60, pl. ix, f. 22, 23 (1867).

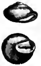
Tennessee, Georgia, and Alabama.

Smaller and more delicate than *H. spinosa;* striæ more numerous, thickly set with fine ciliæ, which project at the periphery in a fine fringe, and not like short triangular aculei, as in *spinosa.* The umbilical region is less depressed, the parietal tooth much more delicate, and does not overlap the peristome which stands off from the shell, and is not appressed to it. *H. edgariana* is much more solid and elevated, has the parietal tooth more developed, the peristome notched, as in *H. hirsuta*, but has about the same diameter.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8828	2	Cherokee County, N. C.	T. Bland.	......

Helix stenotrema, Fer.—Shell imperforate, globose, diaphanous, reddish, hirsute, convex above, inflated below; spire elevated; whirls five, somewhat convex, the last anteriorly gibbous, angularly deflected; aperture irregularly transversely lunar, almost linear, contracted by a long, stout, elevated, lamelliform tooth along the whole length of the parietal wall, furnished far within on the base of the last whirl with a transverse tubercle, springing from the axis; peristome scarcely expanded above, thickened by a heavy, regularly curving callus, its basal margin with a small notch. Greater diam. 10, lesser 9; height 6 mill.

Fig. 195.



Helix stenotrema.

Helix stenotrema, Ferussac in Mus. teste Pfeiffer, Symb. II, 39, excl. *pustula.*—Reeve, Con. Icon. 702.—W. G. Binney, Terr. Moll. IV, 61.—Bland, Ann. N. Y. Lyc. VII, 327.

Helix hirsuta, var. *α*, Ferussac, Hist. pl. 1, A, f. 3.—*β*, Pfeiffer, Mon. Hel. Viv. I, 421; in Chemnitz, ed. 2, I, 376 (1846), pl. lxv, f. 12–14 (1849), var. *stenotrema.*—Var. Binney, Terr. Moll. II, 151, pl, xlii, f. 4.—Deshayes in Fer. I, 140.

Stenotrema convexa, Rafinesque, Enum. and Acc. 3 (1831); Binney and Tryon ed., 28.

Stenotrema stenotrema, Tryon, Am. Journ. Conch. III, 56, pl. ix, f. 21, 30 (1867).

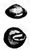
It is not found in the Eastern or Middle States, but from North Carolina and Kentucky it extends through all the Southern States. Also in Indiana, and in the postpleiocene of the Mississippi Valley.

In *H. stenotrema* the notch is invariably small, and more central than in *H. hirsuta;* the parietal tooth is more produced over the aperture, and its lower edge is a regular curve, not somewhat sinuous as in the latter and *H. spinosa;* it is also curved downwards at its outer extremity, not terminating abruptly, as usual in those species. The form of the parietal tooth, however, varies in *H. hirsuta*, from which this species can chiefly, if indeed not alone, be distinguished by the size and position of the notch.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
7999	11	Alabama,	......	......
8609	2	....	W. G. Binney.	Cab. series.
8963		Hot Springs, Ark.	Dr. B. Powell.	......

Helix hirsuta, Say.—Shell imperforate, subglobose; epidermis brownish, or chestnut, covered with numerous, sharp, rigid hairs; whirls five, rounded; suture distinct; aperture contracted, very narrow, almost closed by an elongated, lamelliform tooth, situated on the parietal wall, and extending from the centre of the base, within the junction of the peristome with the outer whirl, into the edge of the aperture; peristome narrow, very much depressed, and reflected against the outer whirl, with a deep cleft or fissure near the centre of the basal margin; umbilicus wholly covered; base convex; far within the base of the shell is a transverse tubercle starting from the axis. Greater diam. 7½, lesser 7; height 4⅔ mill.

Fig. 196.



Helix hirsuta.

Helix hirsuta, Say, Journ. Phila. Acad. I, 17 (1817); II, 161; ed. Binney, 8.—Binney, Bost. Journ. Nat. Hist. III, 365, pl. x, f. 3 (1840); Terr. Moll. II, 150, pl. xlii, f. 3, excl. *stenotrema.*—DeKay, N. Y. Moll. 36, pl. iii, f. 27.—Gould, Invertebrata, 175, f. 116 (1841).—Ferussac, Tab. Syst. 38; Hist. pl. I, a, f. 1.—Deshayes in Lam. VIII, 113; ed. III, 308; Encycl. Méth. II, 253 (1830); in Fer. I, 140.—Mrs. Gray, Fig. of Moll. An. pl. cxciii, f. 8, ex Bost. Journ.—Pfeiffer, Mon. Hel. Viv. excl. var. *β*, I, 421; in Chemnitz, ed. 2, excl. var. I, 374 (1846), pl. lxv, f. 9-11 (1849).—Reeve, Con. Icon. no. 714 (1852).—Leidy, T. M. U. S. I, 257, pl. xi, f. 5, 6 (1851), anat.—W. G. Binney, Terr. Moll. IV, 62.—Bland, Ann. N. Y. Lyc. VII, 327.—Morse, Amer. Nat. I, 151, f. 14, 15 (1867).

Helix sinuata, γ, Gmelin (teste Pfeiffer).

Helix isognomostomos, γ, Gmelin (teste Pfeiffer).

Tridopsis hirsuta, Woodward, Man. pl. xii, f. 7, no desc.

Helix fraterna, Wood, Index Suppl. 21, pl. viii, f. 16 (1828); ed. Hanley, 226, f. 16.

? *Helix porcina*, Say, Long's Exped. (1824), II, 257, pl. xv, f. 2 (young); Binney's ed. 30, pl. lxxiv, f. 2.—DeKay, N. Y. Moll. 45 (1843).—Pfeiffer, Mon. Hel. Viv. III, 97.—Bland, Ann. N. Y. Lyc. VI, 344, with fig. (1858).

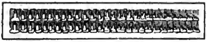
Stenotrema hirsuta, Tryon, Am. Journ. Conch. III, 57, pl. ix, f. 24 (1867).

From New England to Kansas and Virginia. Also in the post-pleiocene beds of the Mississippi Valley.

The last whirl in front of the aperture, especially in the larger forms, is more or less angulated, but never carinated. The position of the parietal tooth is often rather oblique, but usually nearly parallel with the peristome, and is more or less distant from it. The nature of the epidermis varies; in some forms the hairs are very numerous, in others comparatively few. Spiral impressed lines sometimes occur beneath the epidermis, at the base of the shell.

The central teeth of the lingual membrane are tricuspid, the side cusps very small; the laterals of same shape, but bicuspid; uncini irregularly toothed.

Fig. 197.



Lingual dentition of *Helix hirsuta*.

Cat. No	No. of Sp.	Locality.	From whom received.	Remarks
7992	6	Columbus, O.	Dr. J. Lewis.	......
7995	6	Alabama.	......	......
7996	3	Milwaukee, Wis.	I. A. Lapham.	......
7997	8	District of Columbia.	W. Stimpson.	......
7998	4	Marietta, Ohio.	W. Holden.	......
8624	6	Ohio.	W. G. Binney.	Cab. series.
8748	3	....	......	......
8760	2	Ohio.	W. Stimpson.	......
8770	8	Massachusetts.	"	......

Helix maxillata, Gould.—Shell imperforate, globose-conic, rather solid, completely covered with short hairs, chestnut-colored; spire convex-conoid, apex obtuse; whirls five, rather convex, gradually increasing, the last anteriorly deflected, constricted, subinflated below; aperture oblique, linear, almost closed by a broad, jaw-shaped denticle within the peristome; peristome thickened, its terminations joined by a stout, erect parietal callus, the right margin subrectilinear, arched, angularly merging into the very heavy basal margin; within the base of the shell is a transverse tubercle. Greater diam. 7, lesser 6; height 5 mill.

Fig. 198.

Helix maxillata.

Helix maxillata, GOULD, Proc. Bost. Soc. III, 38; in Terr. Moll. II, 157, pl. xl, a, f. 2.—PFEIFFER, Mon. Hel. Viv. III, 126; IV, 164.—W. G. BINNEY, Terr. Moll. IV, 65.

Stenotrema maxillata, TRYON, Am. Journ. Conch. III, 57, pl. ix, f. 31, 35 (1867).

Tennessee, Alabama, Georgia.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
6030	3	Columbus, Ga.	Dr. J. Lewis.	......
8632	5	"	"	Cab. series.

Helix germana, GOULD.—Shell imperforate, solid, depressed, low-conical above, convex beneath, slightly angular at periphery, covered with a scabrous, rusty horn-colored epidermis, beset with scattered hairs; whirls five and a half, closely revolving, separated by a well impressed suture; aperture lunate, the basal portion being but slightly curved, and turning upward at a rather sharp angle; peristome incumbent, with a deep stricture behind it, moderately reflexed, roseate; on the parietal wall of the aperture is a distinct, oblong, erect, white tooth, not connected with either extremity of the peristome. Greater diam. 7½, height 5 mill.

Fig. 199.

Helix germana.

Helix germana, GOULD, U. S. Expl. Exped. Moll. (1852), 70, f. 40, a, b, c; Terr. Moll. II, 156, pl. xl, a, f. 3.—PFEIFFER, Mon. Hel. Viv. III, 269.—W. G. BINNEY, Terr. Moll. U. S. IV, 11.

Stenotrema germana, TRYON, Am. Journ. Conch. III, 58, pl. ix, f. 22, 23 (1867).

Oregon.

Helix monodon, RACKETT.—Shell imperforate or umbilicated, globose-depressed, diaphanous, reddish horn-colored, covered with short hairs; spire rather convex; whirls five and a half, the upper ones flattened, the two last convex, the last anteriorly gibbous, constricted at the aperture; umbilicus more or less opened, or completely closed;

Fig. 200.

Var. *leaii*.[1]

Fig. 201.

Helix monodon.

Fig. 202.

Var. *fraterna.*

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[1] The specimen figured is abnormal in not having a parietal tooth.

aperture widely lunar, somewhat narrowed by a lamelliform tooth on the parietal wall; peristome acute, reflected, thickened with white callus within; a transverse internal tubercle on the base of the shell. Greater diam. 11, lesser 10; height 6 mill.

Helix monodon, Rackett, Linn. Trans. XIII, 42, pl. v, f. 2 (1822); ed. Chenu, 269, pl. xxvii, f. 5.—Wood, Ind. Supplem. pl. vii, f. 15 (1828); ed. Hanley, 226, f. 15.—Binney, Bost. Journ. Nat. Hist. III, 360, pl. x, f. 1 (1840); Terr. Moll. II, 147, pl. xii, lower figs.—Gould, Invertebrata, 174, f. 113 (1841).—Adams, Vermont Mollusca, 159 (1842).—W. G. Binney, Terr. Moll. IV, 60.—DeKay, N. Y. Moll. 35, part, excl. syn., pl. iii, f. 19, not f. 21, a, b (1843).—Mrs. Gray, Fig. Moll. An. pl. cxciii, f. 11 (ex Bost. Journ., no desc.).—Billings, Canadian Nat. II, 100, f. 6 (1857).—Morse, Amer. Nat. I, 151, f. 12, 13 (1867).—Pfeiffer. Mon. Helic. Viv. IV, 320.

Helix convexa, Chemnitz, part (excl. syn. et tab. lxvi, f. 24, 27), pl. x, 17, 18.—Pfeiffer, Mon. Hel. Viv. III, 268 (excl. β et γ).—Deshayes in Lam. VIII, 112; 3d ed. III, 308; Encycl. Méth. II, 253 (1830); in Fér. *l. c.* I, 144.—Reeve, Con. Icon. 696 (1852), excl. syn.; no. 717 (1854).

Helicodonta hirsuta, a, Férussac, Tabl. Syst. 101, no desc.

Stenotrema monodon, Morse, Journ. Portl. Soc. I, 10, f. 13, pl. ii, f. 2; pl. iv, f. 14 (1864).—Tryon, Am. Journ. Conch. III, 56, pl. ix, f. 18, 20 (1867).

VAR. FRATERNA.

Helix fraterna, Say, Long's Exp. II, 257, pl. xv, f. 3; Binney's ed. 30, pl. lxxiv, f. 3.—Mrs. Gray, Fig. Moll. An. pl. cxciii, f. 5, no descr. —Binney, Bost. Journ. Nat. Hist. III, 363, pl. x, f. 2, not of Wood.

Helix monodon, DeKay, N. Y. Moll. *l. c.* ex parte, pl. iii, f. 21, a, b (1843). —Wood, Ind. Suppl. pl. vii, f. 15.

Helix convexa, Chemnitz, ed. 2, I, 86, ex parte.—Var., Reeve, Con. Icon. *l. c.*—β, Pfeiffer, Mon. Hel. Viv. I, 420.

Helix monodon, β, Pfeiffer, *l. c.* IV, 320.

VAR. LEAII.

Helix convexa, γ, Pfeiffer, *l. c.*—Var. Chemnitz, *l. c.* pl. lxvi, f. 24, 25.

Helix monodon, γ, Pfeiffer, IV, 320.—Part Binney, Terr. Moll. pl. xii, central figures.

Helix leaii, Ward, MS. teste Binney.

—— Lister, Syn. Conch. pl. xciii, f. 94.

All of eastern North America, through Canada. Also in the postpleiocene of the Mississippi Valley.

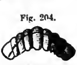
The varieties of this shell present remarkable differences in size and coloring, and in the form of the umbilicus. The transverse diameter varies from one-sixth to three-sixths of an inch, and the form from subglobular in small specimens to a very flattened shape in the larger. The coloring exhibits every shade, from light amber to dark chestnut. The whirls of some revolve about the axis at such a distance as to leave a deep and wide umbilicus (*monodon*); while in others they are in such near approximation as to permit only a small perforation, which the narrow, reflected peristome is sufficiently wide to cover (*fraterna*). The hairy projections of the epidermis are most distinct upon the young shells, but are often wanting at every stage of growth. The oblique striæ are so fine as hardly to be visible; and in some instances the shell appears to be glabrous. Very beautiful specimens, about one-fourth of an inch in diameter, with a dark, shining epidermis and open umbilicus, occur in Ohio, Indiana, Iowa, and Michigan. They are more convex, and, as the same number of volutions is contained in half the space, they *appear* to have more whirls than the common variety. Some persons have considered these to form a distinct species (*H. leaii*, Ward, MSS.); but I do not see that they can, with propriety, be separated.

Fig. 203.

Helix monodon.

Fig. 203 is drawn from a curious pathological specimen. The peristome having been broken after the animal's arrival at maturity, a new peristome has been formed somewhat in the rear of the first, and a new parietal tooth added. The base of the shell was purposely broken to show the position of the internal tubercle.

Fig. 204.

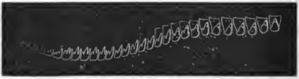


Jaw of *Helix monodon.* [Morse.]

The jaw of *H. monodon* is slightly arcuate, stout, bluntly rounded at ends; anterior surface with broad, stout ribs denticulating each margin.

Lingual membrane with 100 rows of 28—1—28 teeth each; centrals and laterals stout, with a short, pointed apex; uncini irregularly furnished with long denticles.

Fig. 205.



Lingual dentition of *Helix monodon.* [Morse.]

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
7987	5	Big Sioux.	......	......
7988	1	Alabama.	......	......
8607	3	....	W. G. Binney.	Cab. series.
8790	4	Massachusetts.	W. Stimpson.	......

VAR. FRATERNA.

Cat. No.	No. of Sp.	Locality.	From whom received	Remarks.
7989	10	Columbus, Ohio.	Dr. J. Lewis.	......
7990	8	Hiram, Ohio.	S. M. Luther?	......
8032	1	Milwaukee, Wis.	I. A. Lapham.	......
8625	4	....	W. G. Binney.	Cab. series.
8811	12	Texas.	......	......

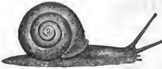
VAR. LEAII.

Cat. No.	No. of Sp	Locality.	From whom received.	Remarks.
7991	9	Milwaukee, Wis.	I. A. Lapham.	......
7993	5	Columbus, Ohio.	Dr. J. Lewis.	......
8608	4	....	W. G. Binney.	Cab. series.
8789	2	Ohio.	......	......

SUBGENUS **TRIODOPSIS**, Raf.

Shell imperforate or umbilicated, orbicularly depressed or subglobose; more or less obliquely striated; whirls 5–7, the last somewhat deflexed in front; aperture sinuously-coarctate, subtriangular; peristome white, thickened, broadly and angularly reflexed, usually dentate; parietal wall of the aperture with a strong, obliquely entering denticle.

Fig. 206.



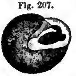
Animal of *Helix palliata*.

Animal (of *H. palliata*) long, narrow, with long and slender eye-peduncles; foot narrow behind, terminating in an acute point.

Helix palliata, SAY.—Shell with the umbilicus closed, thin, depressed; epidermis dark brown or chestnut-color and rough with minute, acute projections and stiff hairs; whirls five, flattened above and rounded below, with numerous very fine, oblique striæ; aperture three-lobed, much contracted by the peristome and teeth; peristome white, sometimes edged

with brown, widely reflected, with two projecting teeth on the inner margin, the one near its junction with the body-whirl acute and prominent, the other, on the basal portion, long, lamellar, and but little prominent; parietal wall with a very prominent, white, curved tooth, projecting nearly perpendicularly from the shell, and forming one boundary of the aperture; umbilicus covered with a white callus, the continuation of the reflected peristome; base convex. Greater diam. 21, lesser 18; height 10 mill.

Fig. 207.



Helix palliata.

Helix palliata, Say, Journ. Phila. Acad. II, 152 (1821); Binney's ed. 10.—Binney, Bost. Journ. Nat. Hist. III, 353, pl. vii (1840); Terr. Moll. II, 136, part, pl. xiv.—Adams, Vermont Mollusca, 159 (1842).—Leidy, T. M. U. S. I, 253, pl. vii, f. 8 (1851), anat.—DeKay, N. Y. Moll. 33, pl. iii, f. 36 (excl. a, b), (1843), excl. syn. pars.—Pfeiffer, Mon. Hel. Viv. I, 316; in Chemnitz, ed. 2, I, 359, pl. lxii, f. 15, 16 (1849).—Mrs. Gray, Fig. Moll. An. pl. cxciii, f. 8, ex Bost. Journ. (no descr.).—Deshayes in Fer. I, 144 (excl. var.).—Reeve, Con. Icon. no. 678.—W. G. Binney, Ter. Moll. IV, 56.—Bland, Ann. N. Y. Lyc. VII, 441.—Morse, Amer. Nat. I, 150, f. 10, 11 (1867).

Helix denotata, Ferussac, Tab. Syst. 38 (1822), no descr.; Hist. pl. xi, a, f. 5; pl. I, a, f. 7.—Deshayes in Lam. VIII, 115; ed. 3, III, 309.

Helix notata, Deshayes, Encycl. Méth. II, 224 (1830).

Xolotrema palliata, Tryon, Am. Journ. Conch. III, 49, pl. ix, f. 4 (1867).

From Canada to Georgia through eastern North America. Also in the postpleiocene of the Mississippi Valley.

Animal of a uniform, blackish, slate-color over the whole upper surface; foot narrow, in length double the diameter of the shell, and terminating in an acute point; eye-peduncles one-third of an inch long; eyes not distinguishable from the general color (see p. 123).

The nature of the epidermis and sculpturing are the only constant specific characters which distinguish *H. palliata* from *H. obstricta*. In the former the epidermis has "numerous minute tuberculous acute prominences;" the striæ are close together, and somewhat irregular in development. In the typical form the whirls are convex, with a well impressed suture; the last whirl is obtusely angulated in front of, but not behind the aperture.

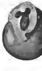
The species varies in the form of the whirls and extent of the angulation of the periphery, as follows:—

Var. β.—Whirls flattened above, slightly exserted, the last more sharply angulated in front of the aperture, with the striæ, especially behind the aperture, more distinctly defined. Greater diam. 22, lesser 19½; height 8½ mill. (5 whirls). Kentucky and Tennessee.

Var. γ.—Whirls planulate above, and so exserted as to show the carinated edges of all excepting the apicial whirls, the last whirl with an acute projecting carina continued to the back of the aperture; the umbilicus not always entirely covered by the reflected lip. Greater diam. 21½, lesser 18½; height 7 mill. (5 whirls). Tennessee.

A curious form of the species is figured here, in which the peristome is carried around the umbilicus, instead of over it.

Fig. 208.



Helix palliata.

The lingual membrane has 115 rows of 34—1—34 rows each; central teeth long, conical, with a pointed apex; laterals bicuspid, the inner cusp of same shape as the central teeth; uncini stout, irregularly denticulated.

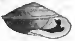
Fig. 209.

Lingual dentition of *Helix palliata.*

Cat. No	No. of Sp.	Locality.	From whom received.	Remarks.
7931	7	W. States.	W. Stimpson.	......
8591	4	....	W. O. Binney.	Cab. series.
8637	2	Columbus, Oa.	Dr. J. Lewis.	"

Helix obstricta, Say.—Shell with the umbilicus closed, depressed, with heavy, rib-like striæ, and interstitial, minute, revolving lines, reddish horn-color; spire flattened; whirls five, depressed, the last convex below, with a prominent, acute carina above; aperture oblique, subtriangular, narrowed by a tongue-shaped, arcuately-entering tooth on the parietal wall; peristome thin, broadly expanded, its inner edge with a heavy thickening of white callus, its right portion with a stout erect denticle, its basal portion straight, dilated, reflected, with a long, lamellar, less prominent denticle. Greater diam. 26, lesser 22; height 11 mill.

Fig. 210.



Helix obstricta.

Helix obstricta, Say, Journ. Phila. Acad. II, 154 (1821); Binney's ed. 17. —Pfeiffer, Mon Hel. Viv. I, 317.—Reeve, Con. Icon. no. 683 (1852). —W. G. Binney, Terr. Moll. IV, 57.—Bland, Ann. N. Y. Lyc. VII, 446.

Helix palliata, var. a, Say, Journ. Phila. Acad. II, 152; Binney's ed. 16.

—Var. a, b, DEKAY, N. Y. Moll. 33, pl. ii, f. 16 (1843).—Var. BINNEY, Terr. Moll. II, 137, pl. xv.

Helix appressa, var., DESHAYES in FER. (in plate, not in text).

Helicodonta denotata, var., FERUSSAC, Tab. Syst. 38; Hist. pl. i, A, f. 7, no descr.

Caracolla helicoides, LEA, Trans. Am. Phil. Soc. IV, 103, pl. xv, f. 34; Obs. I, 113 (1834).

Helix caroliniensis, LEA, Trans. Am. Phil. Soc. IV, 108, pl. xv, f. 33; Obs. I, 112 (1834).

Xolotrema obstricta, TRYON, Am. Journ. Conch. III, 49, pl. ix, f. 3 (1867).

Ohio, Indiana, Tennessee, Georgia, South Carolina.

H. obstricta differs from *H. palliata* in the following particulars: The epidermis is free from "tuberculous prominences," but has raised spiral lines between the costæ on the upper and lower surfaces of the shell. It has elevated, rigid, distant costæ, the whirls are subexserted and acutely carinated, the carina of the upper whirls compressed, and overlapping the sutures as in *H. cumberlandiana*. The umbilicus, as in the most carinated form of *H. palliata*, is not always entirely covered by the reflected peristome.

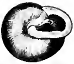
Var. β.—Whirls subexserted, carina less acute and prominent, partially obsolete behind the aperture, not covering the sutures. Greater diam. 24, lesser 19; height 8 mill. (5 whirls). Columbus, Ga. This variety connects *H. carolinensis* with *H. obstricta*, and is generally found in cabinets under the former name.

Var. γ.—Whirls more convex, the last obtusely angulated in front of, but very little behind the aperture. Greater diam. 21, lesser 17; height 7½ mill. (5 whirls). South Carolina. This is the typical *H. carolinensis*, holding precisely the same relation to *H. obstricta*, as *H. palliata* to *H. palliata* var. γ.

Cat No.	No. of Sp.	Locality.	From whom received.	Remarks.
8774	1	....	......	Cab. series.
8836	2	....	Lieut. Kurtz.	......
9192	2	Tenn.	......	......

Helix appressa, SAY.—Shell with the umbilicus covered, orbicularly depressed, pellucid, with rib-like striæ and minute revolving lines, reddish horn-colored; spire flattened; whirls five, flattened above, the last obtusely angular (the angle obsolete anteriorly); aperture oblique, compressed, subtriangular; peristome angularly broadly reflected, thickened within, its terminations joined by a thin callus, on which is an obliquely entering, erect, curved, tongue-shaped tooth, the basal margin with a lamellar-like, long denticle, the right margin sometimes with an erect tooth-like callus. Greater diam. 18, lesser 15; height 8 mill.

Fig. 211.



Helix appressa.

Helix appressa, Say, Journ. Phila. Acad. II, 151 (1821); ed. Binney, 15.—Binney, Bost. Journ. Nat. Hist. III, 356, pl. viii (1840); Terr. Moll. II, 140, pl. xiii.—DeKay, N. Y. Moll. 27, pl. II, f. 11 (1843).—Pfeiffer, Mon. Hel. Viv. I, 317; in Chemnitz, Conch. 2d ed. I, 361, t. lxiii, f. 17, 18.—Reeve, Con. Icon. no. 689.—Deshayes in Fer. Hist. I, 141.—W. G. Binney, Terr. Moll. IV, 59.—Bland, Ann. N. Y. Lyc. VII, 432.

Helix linguifera, Lamarck, An. s. Vert. VI, 90 (1822).—Ferussac, Prodr. 95; Hist. pl. xlix, a, f. 3.—Deshayes, Encycl. Méth. II, 224 (1830); in Lam. VIII, 70; ed. 3, III, 293.—Pfeiffer, Symb. ad Hist. Hel. 19 (no descr.).—Chenu, Ill. Conch. pl. xii, f. 5; pl. vii, f. 6.—Delessert, Recueil, pl. xxvi, f. 5 (1841).

Xolotrema appressa, Tryon, Am. Journ. Conch. III, 50, pl. ix, f. 7, 11 (1867).

In Pennsylvania and New York it is not found east of the Appalachian chain. From thence it ranges to Arkansas; and from Georgia to Illinois.

Fig. 212.

Helix appressa.

Fig. 213.

Helix appressa, var. a.

Fig. 212 represents a smaller, more angular form. Fig. 213 represents the var. a of Say, which has two well developed teeth on the peristome. I have received it from Virginia, Tennessee, Kentucky, Ohio, Indiana, and Illinois.

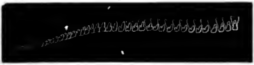
The jaw is very strongly arcuate, of uniform width throughout; anterior surface with ribs, denticulating both margins.

Fig. 214.

Jaw of *Helix appressa.*

Lingual membrane with 105 rows of 40—1—40 teeth each; central long, conical, surmounted with a pointed apex; laterals of same shape, but with an obtuse small side tubercle; uncini with long, irregular denticles.

Fig. 215.

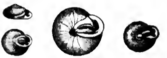


Lingual dentition of *Helix appressa.*

Cat. No	No. of Sp.	Locality.	From whom received.	Remarks.
7903	8	St. Louis, Mo.	......	......
7904	1	Charleston, S. C.	W. Stimpson.	......
7905	3	Ft. Bridger.	Lieut. Bryan.	Var. a. True locality? [W. G. B.
8029	2	Taylor County, Ga.	Dr. H. M. Neisler.	
8622	5	....	W. G. Binney.	Cab. series.
8623	3	Illinois.	R. Kennicott.	"
8745	5	....	......	......
8777	1	Ohio.	......	......

Helix inflecta, SAY.—Shell with the umbilicus closed, depressed; epidermis brownish horn-color, with very fine, hair-like projections; whirls five, with very minute, transverse striæ; suture not much impressed; aperture three-lobed, very much contracted; peristome white, narrow, reflected, with a deep groove or indentation behind the reflection, contracting the opening so that the outer edge of the peristome does not project beyond the surface of the whirl; on the inner margin of the peristome are two acute teeth, with the points directed inwards, one near the base, the other midway between that and the junction of the peristome with the body-whirl, with a circular sinus between them, forming one of the lobes of the aperture; parietal wall with a long, arcuated, white tooth; umbilicus covered, its place considerably impressed. Greater diam. 12, lesser 11; height 6⅔ mill.

Fig. 216.



Helix inflecta.

Helix inflecta, SAY, Journ. Phila. Acad. II, 153 (1821); ed. BINNEY, 16.—BINNEY, Bost. Journ. Nat. Hist. III, 358, pl. ix, f. 1 (1840); Terr. Moll. II, 143, pl. xlv, f. 2, 3.—DEKAY, N. Y. Moll. 45 (1843).—MRS. GRAY, Fig. Moll. An. pl. cxciii, f. 7 (ex Bost. Journ. no descr.).—W. G. BINNEY, Terr. Moll. IV, 59.—BLAND, Ann. N. Y. Lyc. VII, 425.—PFEIFFER, Mon. Hel. Viv. IV, 319.

Helix clausa, FERUSSAC, Tab. Syst. 38, no. 104; Hist. pl. li, f. 2.—DESHAYES, Encycl. Méth. II, 252 (1830); in LAMARCK, VIII, 114; ed. 3, III, 309; in FER. I, 143.—PFEIFFER, Mon. Hel. Viv. I, 420; in CHEMNITZ, 2d ed. I, 368, t. lxiv, f. 25, 26.—REEVE, Con. Icon. no. 704 (1852).

Xolotrema clausa, RAFINESQUE, Enumeration, &c. 3 (1831); ed. BINNEY and TRYON, 68.

Isognomostoma inflecta, TRYON, Am. Journ. Conch. III, 54, pl. ix, f. 10 (1867).

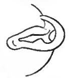
From Texas to the Appalachian chain in Pennsylvania and New York; from Georgia through the northwestern States; also in the postpleiocene of the Mississippi Valley.

The large specimen figured is from University Place, Tenn.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
7910	8	Columbus, Ohio.	Dr. J. Lewis.	......
7911	1	L'eau qui Court.	......	Imperfect.
7960	1	Milwaukee, Wis.	I. A. Lapham.	......
7962	7	N. Georgia.	A. Gerhardt.	......
8606	4	Alabama.	W. G. Binney.	Cab. series.
8966		Hot Spr., Ark.	Dr. B. Powell.	......

Helix rugeli, Shuttleworth.—Shell imperforate, orbicularly-convex, with granulate striations and few hairs, waxen horn-color; spire short, obtuse; whirls five and a half, rather convex, the last suddenly falling in front, and strongly contracted at the aperture; aperture depressed, narrowed by a tongue-shaped, flexuose, strong, parietal denticle; peristome reflected, within thickened, its right termination with a large, obtuse, very deeply-seated tooth (whose position is marked on the exterior of the shell by a groove or pit), the basal terminus furnished with a smaller, transverse, submarginal denticle. Greater diam. 13, lesser 11½; height 6¼ mill.

Fig. 217.



Helix rugeli, enlarged.

Helix rugeli, Shuttleworth, Bern. Mittheil. 1852, 198.—Pfeiffer, Mon. Hel. Viv. III, 268.—Gould in Terr. Moll. III, 18.—W. G. Binney, Terr. Moll. IV, 60, pl. lxxviii, f. 15.—Bland, Ann. N. Y. Lyc. VII, 426.

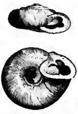
Isognomostoma rugeli, Tryon, Am. Journ. Conch. III, 55, pl. ix, f. 8 (1867).

Tennessee, North Carolina.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8638	1	Tennessee.	W. G. Binney.	Cab. series.

Helix tridentata, Say.—Shell umbilicated, orbicularly-depressed, with crowded rib-like striæ, light horn or chestnut-colored; spire very short; whirls five and a half, rather convex, the last scarcely deflected in front; aperture lunar, subtriangular; peristome white, reflected, its outer contour rounded, thickened within, its terminations converging, joined by a light deposition of callus bearing a tongue-like, erect, entering tooth, both the right and basal portions bearing on the inner margin a stout, acute denticle. Greater diam. 16, lesser 14; height 8 mill.

Fig. 218.



Helix tridentata.

Helix tridentata, Say, Nich. Encycl. pl. ii. f. 1 (1817, 1818, 1819); Binney's ed. 6, pl. lxx, f. 1.—Eaton, Zool. Text-Book, 193 (1826).—

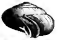
Ferussac, Tab. Syst. 38; Hist. pl. li, f. 3.—Wood, Ind. Supplem. 21, pl. vii, f. 2 (1828); ed. Hanley, 226, f. 11.—Deshayes, Encycl. Méth. II, 213 (1830); in Lam. VIII, 115; ed. 3, 309; in Fer. *l.* c. I, 72.—Binney, Bost. Journ. Nat. Hist. III, 382, pl. xvii (1840), part; in Terr. Moll. II, 183, pl. xxvii.—DeKay, N. Y. Moll. 28, pl. ii, f. 7 (1843).—Adams, Vermont Mollusca, 160 (1842).—Gould, Invertebrata, 173, f. 115 (1841).—Pfeiffer, Mon. Hel. Viv. I, 412; in Chemnitz, 2d ed. I, 84, pl. x, f. 7, 8.—Potiez et Michaud, Gal. I, 114.—Mrs. Gray, Fig. Moll. An. pl. ccxci, f. 3 (ex Bost. Journ., no descr.).—Reeve, Con. Icon. no. 690 (1852).—W. G. Binney, Terr. Moll. IV, 70.—Bland, Ann. N. Y. Lyc. VII, 423.—Morse, Amer. Nat. I, 150, f. 8, 9 (1867).

Triodopsis lunula, Rafinesque, En. and Acc. 3; ed. Binney and Tryon, 68.

Triodopsis tridentata, Tryon, Am. Journ. Conch. III, 50, pl. ix, f. 6, 13 (1867).

—— Lister, pl. xcii, f. 92.

Fig. 219.

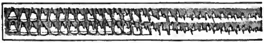


Helix tridentata, deformed.

From Canada through all eastern North America. One of the specimens figured is unusually large. A curious pathological specimen, with a double peristome, is here figured.

The lingual membrane is broad; central teeth long, conical, with an acutely pointed apex; laterals of the same shape, but with a small side-cusp; uncini with long irregular denticles.

Fig. 220.

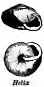


Lingual dentition of *Helix tridentata*. [Leidy.]

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8011	10	Centre County, Pa.	......	......
8012	16	....	......	Series of sizes.
8013	2	Marietta, Ohio.	W. Holden.	......
8612	3	....	W. G. Binney.	Cab. series.

Helix mullani, Bland.—Shell with umbilicus partially covered, globoso-depressed, dark horn-colored, irregularly striated, having a thin epidermis with microscopic spiral lines, and tubercles (the latter with hairs?); beneath the epidermis shining; spire short; whirls five and a half to six, convex, the last gibbous above, scarcely descending, the base rather smooth, much constricted at the aperture; aperture subtriangular, oblique, with a short, white, linguiform, parietal tooth; peristome white, or reddish horn-colored, thickened, expanded, and roundly reflected, with two teeth on the margin of the callus, the lower one lamelliform, the other small, often obsolete, the columellar margin partially covering the middling-sized, pervious umbilicus. Greater diam. 13½, lesser 11; height 7 mill.

Fig. 221.



Helix mullani.

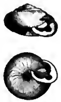
Helix mullani, Bland & Cooper, Ann. N. Y. Lyc. VII, 363, pl. iv. f. 16, 17 (1861).
Triodopsis mullani, Tryon, Am. Journ. Conch. III, 52, pl. ix, f. 15 (1867).

Dead specimens found near Cœur d'Alène Mission, Cœur d'Alène Mountains; living ones on the west side of the Bitter Root Mountains, Washington Territory; St. Joseph's River, 1st Camp, Oregon. Under logs and in dry pine woods.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
9148	1	St. Joseph's River, 1st Camp, Oregon.	T. Bland.	Type.

Helix fallax, Say.—Shell umbilicated, depressed-globose, with rib-like striæ, reddish horn-colored; spire convex; whirls six, rather convex, the last deflected anteriorly, constricted; aperture trilobed, contracted by a large, oblique, tongue-shaped, arcuately-entering tooth on the parietal wall; peristome reflected, thickened within, white, with two teeth, the upper one bending inward not on the edge, the other subbasal. Greater diam. 13, lesser 11; height 7½ mill.

Fig. 222.



Helix fallax.

Helix fallax, Say, Journ. Phila. Acad. V, 119 (1825); Binney's ed. 27.—DeKay, N. Y. Moll. 28, pl. iii, f. 23 (1843).—Pfeiffer, Mon. Hel. Viv. I, 412; in Chemnitz, ed. 2, I, 364, pl. lxiv, f. 7–9.—Reeve, Con. Icon. no. 686 (1852).
Helix tridentata, Binney, part, Bost. Journ. Nat. Hist. III, 382, pl. xviii, f. 3 (1840); Terr. Moll. II, 183, pl. xxviii.—W. G. Binney, Terr. Moll. IV, 72.
Triodopsis fallax, Tryon, Am. Journ. Conch. III, 51, pl. ix, f. 12 (1867).

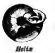
From Canada to Texas and Florida.

Nearly allied to *H. tridentata*, but in this, the spire is more elevated, and sometimes has six full volutions. There is a deep groove behind the peristome, contracting the aperture; the peristome is widely reflected, and directed inwards, forming a basin-shaped mouth; the upper tooth on the peristome is broader, sometimes bifid, and even trifid, and very much inflected; the parietal tooth extends quite to the base of the shell, and unites with the extremity of the peristome; the aperture is nearly filled up by the teeth and the contraction of the peristome.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
7901	7	Hiram, Ohio.	S. M. Luther.	......
7902	1	L'eau qui Court.	......	......
8021	5	Columbus, Ohio.	Dr. J. Lewis.	......
8614	4	" "	"	Cab. series.

Helix introferens, Bland.—Shell umbilicate, globose, depressed, thin, with rib-like striæ, yellowish horn-colored; spire convex; whirls six, moderately convex, the last scarcely descending, much constricted at the aperture, with two exterior pits, subangular at the periphery, convex beneath, grooved within the umbilicus; aperture oblique, lunate, with a well-developed, arcuate parietal tooth; peristome white, thickened within, reflected; on the right margin an obtuse inflected tooth, at the base a submarginal lamelliform tooth, with transverse tubercle in the centre; the basal lamella continued within the aperture, where it forms a strong white tubercle. Greater diam. 15, lesser 13; height 7 mill.

Fig. 223.



Helix introferens.

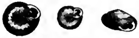
Helix introferens, Bland, Ann. N. Y. Lyc. VII, 117, pl. iv, f. 3, 4 (1860).
Triodopsis introferens, Tryon, Am. Journ. Conch. III, 51, pl. ix, f. 5 (1867).

Gaston County, N. C.; Salem, N. C.

This shell is closely allied to *H. vultuosa*, and also to *H. fallax.* It differs from the latter in the narrower umbilicus, which only shows the penultimate whirl; in the groove in the last whirl within the umbilical opening, the character of the basal tooth, and the internal tubercle, which does not prevail in *fallax* and its immediate allies *tridentata* and *hopetonensis.* In *H. introferens* the upper tooth is less deeply seated and less inflected, and the basal one is broader, and more elevated than in *vultuosa*, the parietal tooth is more arcuate, being indeed subangular, but is without the indication, noticeable in *vultuosa*, of a callus extending from its lower termination towards the upper angle of the peristome. *H. vultuosa* is even smaller than the var. *minor* of this species, which is only 11 mill. in diameter.

Helix hopetonensis, Shuttleworth.—Shell with a narrow, scarcely pervious umbilicus, depressed-globose, with numerous rib-like striæ, olive horn-color; spire obtuse, convex; whirls five and a half, rather convex, the last scarcely deflected in front, constricted at the aperture; aperture lunar, tridentate; a moderate, tongue-shaped, slightly entering parietal denticle; peristome reflected, within thickened with a white, light callus, its right margin with a small, somewhat anterior denticle, its basal terminus with a marginal denticle. Greater diam. 13, lesser 11; height 6 mill.

Fig. 224.



Helix hopetonensis.

Helix hopetonensis, Shuttleworth, Bern. Mitt. 1852, 198.—Reeve, Con. Icon. no. 709 (1852).—Pfeiffer, Mon. Hel. Viv. III, 263; in Chemnitz, ed. II, 420, pl. cxlviii, f. 17, 18 (pl. lxiv, f. 7-9 ?).—Gould, Terr. Moll. III, 17.—W. G. Binney, Terr. Moll. IV, 72, pl. lxxvii, f. 16.

Helix tridentata, var., Binney in Bost. Journ. Nat. Hist. III, 382, pl. xviii, f. 2.—Ferussac, Hist. pl. li, f. 3, small fig. on the left.

Helix tridentata, var. *epliabus*, Say, of Ravenel's Cat. 9 (1834), no descr.

Triodopsis hopetonensis, Tryon, Am. Journ. Conch. III, 52, pl. ix, f. 9 (1867).

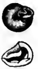
Georgia and Florida.

It differs from *H. fallax* in its smaller, scarcely pervious umbilicus, its deeper color, lighter peristome, and denticles being more widely separated.

Cat. No.	No. of Sp	Locality.	From whom received.	Remarks.
7926	6	Georgia.	W. G. Binney.	......
8600	11	St. Simon's Isle, Ga.	Dr. J. Lewis.	Cab. series.
8773	2	Georgia.	W. Stimpson.	......
8791	8	South Carolina.	"	Cab. series.
9195	2	" "	Gen. Totten.	(*epliabus.*)
9191	3	Fernandina.	" "	....

Helix vultuosa, Gould.—Shell umbilicated, orbicular, depressed, about equally convex on both sides, rather solid, dark horn-color, delicately striated; spire a low dome, composed of about five and a half whirls, which are moderately convex, and separated by a well-defined suture, the exterior one somewhat angular at periphery; beneath, well rounded, and perforated by a deep umbilicus, about one-fourth as broad as the base; aperture rather large, lunate; peristome moderately reflexed, tortuous, white, having at the base a small tooth, and at the centre a deeply-seated, more expanded, reflexed tooth; the parietal wall bears a stout, elevated, arcuated, oblique lamella, joined to the lower extremity of the peristome only; on the base of the shell is a transverse luternal tubercle. Greater diam. 10, lesser 9; height 5½ mill.

Fig. 225.



Helix vultuosa.

Helix vultuosa, GOULD, Proc. Bost. Soc. Nat. Hist. III, 39 (1848); in Terr. Moll. II, 189, pl. xl, a, f. 4.—REEVE, Con. Icon. no. 711 (1852).—PFEIFFER, Mon. Hel. Viv. III, 263; in CHEMNITZ, ed. 2, III, 305, pl. cxxvii, f. 10–12.—W. G. BINNEY, Terr. Moll. IV, 75.—BLAND, Ann. N. Y. Lyc. VII, 439, pl. iv, f. 21.

Triodopsis vultuosa, TRYON, Am. Journ. Conch. III, 53, pl. ix, f. 14 (1867).

Arkansas and Texas.

Helix loricata, GOULD.—Shell umbilicated, depressed, spire less convex than the base, thin, of a yellowish-green color, having the surface everywhere ornamented with small, crescent-formed scales of the epidermis, in relief, arranged along the lines of growth, and in quincunx; whirls five and a half, slightly convex, separated by a deeply impressed suture, and forming a low, conical spire; the periphery of the last whirl is slightly angular near its posterior portion; the base is rounded, tending rapidly to a deep, umbilical depression, with a small perforation; aperture small, very oblique, crescentic, having a small, acute tooth on the right margin of the peristome, a transversely oblong one at basal margin, and a prominent, compressed, curved, nearly horizontal one on the parietal wall, thus giving a three-lobed outline to the aperture; peristome white, slightly reflected, having a very profound constriction of the whirl directly behind it; on the base of the shell is an internal, transverse tubercle. Greater diam. 6, height 3½ mill.

Fig. 226.

Helix loricata, enlarged.

Helix loricata, GOULD, Proc. Bost. Soc. Nat. Hist. II, 165 (1846); Moll. Expl. Exped. 68, f. 39, a, b, c,; T. M. U. S. II, 145, pl. xxix a, f. 1.—PFEIFFER, Mon. Hel. Viv. I, 416.—W. G. BINNEY, Terr. Moll. IV, 11.

Helix lecontii, LEA, Trans. Am. Phil. Soc. X, 303, pl. xxx, f. 13; Obs. V, 59 (1853).—PFEIFFER, formerly, Mon. Hel. Viv. III, 265.

Triodopsis loricata, TRYON, Am. Journ. Conch. III, 54, pl. ix, f. 16, 19 (1867).

California, near San Francisco, to Klamath Co.

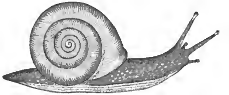
Cat No.	No. of Sp.	Locality	From whom received.	Remarks.
8560	1	....	......	Cab. series.
8725	1	San Francisco.	Rowell.	......

SUBGENUS MESODON, Raf.

Shell umbilicated, or with the umbilicus closed, subglobose or orbicularly depressed, thin, delicately striate, sometimes decussatedly sculptured; whirls 5–6, regular; aperture rotundly lunar, sometimes narrowed by a small denticle on the parietal wall; peristome white-lipped, expansively reflexed, its basal margin sometimes unidentate.

Animal (of *H. albolabris*) varying from pure white and cream color, through various shades of gray to blackish; upper part of head and neck slightly brownish; extremities of eye-peduncles smoky; eyes black. Eye-peduncles more than 12 mill. in length when fully extended, slender and cylindrical. Foot with a slightly expanded margin terminating posteriorly in an acute angle. Glandular tubercles very distinct and prominent, on the back arranged longitudinally, on the eye-peduncles long and narrow. Extreme length 62 mill.

Fig. 227.

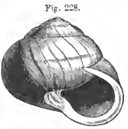


Animal of *Helix albolabris.*

Helix major, Binney.—Shell imperforate, conoidly-subglobose, solid, with crowded, fold-like striæ, and a few interstitial microscopic revolving lines; reddish horn-color or chestnut; spire conoid, the apical point small; whirls six, convex, the last ventricose, scarcely descending in front; aperture diagonal, roundly lunate, whitish within; peristome with a white thickening, its terminations joined by a thin callus, the right and basal portions rather broadly expanding and reflected, the columellar portion subdentate, dilated, subexcavated, adhering. Greater diam. 37½, lesser 31; height 26 mill.

Helix major, Binney, Bost. Journ. Nat. Hist. I, 473, pl. xii (1837); Terr. Moll. II, 96, pl. l.—DeKay, N. Y.

Fig. 228.



Helix major.

Moll. 45 (1843).—Mrs. Gray, Fig. of Moll. An. pl. cccxci, f. 1, from Bost. Journ., no descr.—W. G. Binney, Terr. Moll. IV, 43.—Pfeiffer, Mon. Hel. Viv. IV, 320.

Helix albolabris, var., Férussac, Hist. pl. xliii, f. 4; pl. xlvi, a, f. 7.—Deshayes in Fér. part.—Pfeiffer, Symbolæ, II, 22; Mon. Hel. Viv. I, 290; in Chemnitz, ed. 2, I, 81.—Reeve, Con. Icon. 656.—Bland, N. Y. Lyc. VI, 359.

Mesodon major, Tryon, Am. Journ. Conch. III, 43, pl. viii, f. 5 (1867).

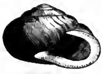
Tennessee, Alabama, Florida, Georgia, and South Carolina.

It is much more globose than *H. albolabris*, of a coarser and more solid texture, and the striæ of increase are much more raised and prominent, so much so, indeed, as to leave distinct grooves between them. The revolving striæ, so distinct on that shell, are either wanting or very indistinct. The aperture is smaller in proportion to the size of the shell, less flattened towards the plane of the base, and more rounded. The parietal wall and umbilicus are in many instances covered with a smooth and shining, semi-transparent, testaceous callus. The margin of the peristome is thickened, the peristome itself is narrower, less abruptly reflected, and not so much flattened, and there is often a tooth-like process on the inner and upper side of the margin near the umbilicus. The color of the epidermis is generally much darker. The only considerable variation in the characters of the shell is caused by the depression of the spire in some individuals, and indeed in all specimens from certain localities. In its most perfect condition it is often subconical. It is subject to some irregularities in the form of the aperture, and there is sometimes an indication of pale bands in the epidermis of the body-whirl.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8633	1	Georgia.	W. G. Binney.	Cab. series.
8837	1	Eastern Georgia.	Dr. Jones.	......
8193	1	Alabama.	Gen. Totten.	......
9171	1	....	......	......

Helix albo'abris, Say.—Shell imperforate, convex; epidermis immaculate, of a uniform yellowish-brown, russet, or light chestnut-color; whirls between five and six, with fine parallel striæ running obliquely across them, and spirally striated with very minute and delicate, but distinct, wavy, impressed lines, which are most apparent on the back of the reflected peristome; suture well marked and distinct; aperture contracted by the peristome; peristome white, flattened in the plane

Fig. 229.



Helix albolabris.

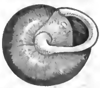
of the mouth, abruptly and very widely reflected; umbilicus of the mature shell covered by the reflected peristome, which is continued to the base of the shell. Greater diam. 36, lesser 26; height 17 mill.

Helix albolabris, Say, Nich. Encycl. pl. I, f. 1 (1817, 1818, 1819); Journ. Acad. Nat. Sci. Philad. II, 161 (1821); American Conch. No. 2, pl. xiii, (1831); Binney's ed. 21, pl. lxix, f. 1.—Chenu, Bibl. Conch. III, 21, pl. iii, f. 3, a.—Adams in Thompson's Vermont, I, 158, with wood-cut.—Eaton, Zool. Text-Book, 193 (1826).—Férussac, Tab. Syst. 36; Hist. pl. xliii, f. 1, 2, 3.—Binney, Bost. Journ. Nat. Hist. I, 475, pl. xiii (1837); Terr. Moll. II, 99, pl. ii.—DeKay, N. Y. Moll. 26, pl. ii, f. 12 (1843).—Gould, Invert. 170, f. 101 (1841).—Leidy, T. M. I, 252, pl. vi (1851), anat.—Pfeiffer, Symb. II, 22, excl. γ and δ; Mon. Hel. Viv. I, 290, excl. β and γ; in Chemnitz, ed. 2, I, 81, pl. xv, f. 7, 8 (1847), excl. var. C and D, pl. x, f. 4, 5.—Potiez et Michaud, Gal. I, 69.—Reeve, Con. Icon. no. 624.—Deshayes in Fér. I, 137, pl. xliii, f. 1, 2, 3, 5.—Billings, Canadian Nat. and Geol. 1857, II, 98, f. 2, 3.—Bland, Ann. N. Y. Lyc. VI, 358 (1858).—W. G. Binney, Terr. Moll. IV, 43.—Morse, Amer. Nat. I, 6, pl. i, f. 1–11; 96, f. 2 (1867).

Helix rufa, DeKay? N. Y. Moll. 44, pl. iii, f. 30 (1843).

Mesodon albolabris, Morse, Journ. Portl. Soc. I, 8, f. 7, pl. iii, f. 8 (1864).—Tryon, Am. Journ. Conch. III, 39, 44, pl. vii, f. 5–7 (1867).

Fig. 230.

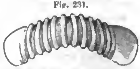


Helix albolabris, var.

Canada to Arkansas, Georgia to Minnesota. Also in the postpleiocene of the Mississippi Valley.

Speciments of *H. albolabris* are sometimes found bearing a well-developed parietal tooth. Such are very plenty in the Alleghany Mountains in Pennsylvania. One is here figured (Fig. 230).

Fig. 231.

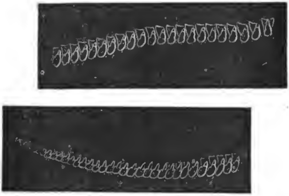


Jaw of *Helix albolabris*. [Morse.]

The saffron-colored jaw of *H. albolabris* is arcuate, of uniform breadth throughout; ends blunt, smooth on their anterior surface, the balance of the jaw with stout ribs, denticulating either margin.

The lingual membrane has 123 rows of 44—1—44 teeth each; centrals long, conical, with an acute apex; laterals of same shape, but with an obsolete, small side-cusp; uncini a modification of laterals, with one long and one short cusp.

Fig. 232.

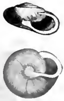


Lingual dentition of *Helix albolabris*. [MORSE.]

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
7978	2	Grand Rapids, Mich.	......	......
7979	1	L'eau qui Court.	......	......
7980	1	....	......	......
7981	3	Eastern Tennessee.	......	Allied to *H. major*.
7982	4	Fleming, Centre Co., Pa.	......	......
7983	3	.... [B., Me.	......	Allied to *H. major*.
7984	4	Broken Cave Isl., Casco	Dr. J. Lewis.	Local var.
7985	1	Milwaukee, Wis.	I. A. Lapham.	......
7986	2	Eagle Isl., Casco B., Me.	Dr. J. Lewis.	Local var.
8041	1	Rock River, Wis.	......	......
8001	2	....	W. G. Binney.	Cab. series.
8002	2	....	"	"
8744	1	....	......	......
8756	2	Massachusetts.	W. Stimpson.	......
8763	4	"	"	......
8779	13	....	"	......
8838	2	Eastern Georgia.	Dr. Jones.	......
9174	200+	Vermont.	J. E. Chittenden.	......
8964		Hot Springs, Ark.	Dr. B. Powell.	......

Helix divesta, GOULD.—Shell imperforate, depressed, somewhat discoidal, of medium thickness and a dingy horn-color, sculptured with coarse oblique furrows; spire slightly convex, whirls about six, a little convex, and separated by a well-impressed suture; the outer whirl is a little angular at its periphery; beneath, it is more smooth, moderately convex, with the central region excavated, and covered with a glazing of white callus; the aperture is lunate, and very oblique; the peristome is white, broadly reflected, its basal portion horizontal, and its outer portion flexuous. Greater diam. 20, lesser 15; height 8 mill.

Fig. 233.



Helix divesta.

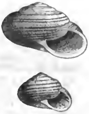
Helix dejecta, Gould, Terr. Moll. II, 91.
Helix abjecta, Gould, Proc. Bost. Soc. Nat. Hist. III, 40 (Oct. 1848); Terr. Moll. II, 122, pl. xlii, e, f. 2.—Pfeiffer, Mon. Hel. Viv. III, 270.
Helix divesta, Gould, Terr. Moll. II, 357.—W. G. Binney, Terr. Moll. IV, 51.—Pfeiffer, Mon. Hel. Viv. IV, 322.
Mesodon divesta, Tryon, Am. Journ. Conch. III, 45, pl. viii, f. 11 (1867).

Wasbita Springs, Arkansas.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8067		Hot Springs, Ark.	Dr. B. Powell.	......

Helix multilineata, Say.—Shell imperforate, depressed-subglobose; spire convex; rather thin; epidermis yellowish-brown, or russet color, with numerous reddish-brown, finely undulated, revolving lines and bands; whirls between five and six, convex, with delicate, parallel, oblique striæ, the last ventricose; suture distinctly marked: aperture lunate, slightly contracted by the peristome; peristome white, not much expanded, reflected, rather thin; umbilical region impressed. Greater diam. 23, lesser 20; height 14 mill.

Fig. 234.



Helix multilineata.

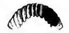
Helix multilineata, Say, Journ. Acad. Phila. II, 150 (1821); ed. Binney, 15.—Ferussac, Hist. pl. xlvi, a, f. 3.—Binney, Bost. Journ. Nat. Hist. I, 480, pl. xiv (1837); Terr. Moll. II, 103, pl. iii.—Leidy, Terr. Moll. U. S. I, 254, pl. viii, f. 1-6 (1851), anat.—DeKay, N. Y. Moll. 41, pl. iii, f. 34 (1843).—Pfeiffer, Symb. ad Hist. Hel. I, 41; Mon. Hel. Viv. I, 290; in Chemnitz, ed. 2, II, 41, pl. lxxi, f. 17-19 (1849).—Reeve, Con. Icon. no. 691 (1852).—Deshayes in Fér. I, 113.—W. G. Binney, Terr. Moll. IV.
Mesodon multilineata, Tryon, Am. Journ. Conch. III, 45, pl. viii, f. 8 (1867).

In the States bordering on the Ohio River, from New York to Minnesota. I have heard of a single specimen being found near Philadelphia.

The specimens figured show how variable the species is in size.

In color it is also very variable, sometimes it is found of an uniform red, at others albino.

Fig. 235.



Jaw of *Helix multilineata.*

Jaw arcuate, of uniform width; ends blunt; anterior surface with numerous, crowded ribs, denticulating either margin.

The teeth on the lingual membrane are arranged 42—1—42; centrals with a long, acutely-pointed middle cusp, and an enlargement at either side of its base; laterals with a long, acutely-pointed cusp, and a short, obsolete side-cusp; uncini large, irregularly bidentate or tridentate.

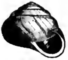
Fig. 236.

Lingual dentition of *Helix multilineata.*

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
7940	1	Milwaukee, Wis.	I. A. Lapham.	......
7958	5	Grand Rapids, Mich.	Dr. J. Lewis.	......
7939	1	Milwaukee, Wis.	I. A. Lapham.	Small form.
6598	4	....	W. G. Binney.	Cab. series.
6598	1	....	"	"
8831	1	Grand Rapids, Mich.	T. Bland.	......

Helix pennsylvanica, Green.—Shell imperforate, convex, elevated; epidermis yellowish horn-color, or russet; whirls six, convex, with crowded, elevated, oblique striæ; suture distinctly marked; aperture subtriangular, contracted by the peristome; peristome white, narrow, reflected, not flattened, with sometimes a slight thickening on the inner side near the base; umbilical region indented. Greater diam. 17, lesser 15; height 11 mill.

Fig. 237.



Helix pennsylvanica.

Helix pennsylvanica, Green, Contributions to Macl. Lyc. No. 1, 8.—Binney, Bost. Journ. Nat. Hist. I, 483, pl. xvi (1837); Terr. Moll. II, 105, pl. vii. —Pfeiffer, Symbolæ, II, 36; Mon. Hel. Viv. I, 291 (excl. *H. clausa*); IV, 321; in Chemnitz, ed. 2, II, 51, t. lxxiii, f. 4, 5 (excl. *H. clausa*).—DeKay, N. Y. Moll. 41, pl. iii, f. 35 (1843).—Mrs. Gray, Fig. Moll. An. pl. cccxi, f. 5, from Bost. Journ., no descr.—Reeve, Con. Icon. no. 676 (excl. syn.).—Bland, Ann. N. Y. Lyc. VI, 299 (1858).—W. G. Binney, Terr. Moll. IV, 45.

Helix mitchelliana, Deshayes in Fer. I, 137, pl. xcvii, f. 4–7, nec 13–16.
Mesodon pennsylvanica, Tryon, Am. Journ. Conch. III, 44, pl. viii, f. 9 (1867).

Western part of Pennsylvania, Ohio, Illinois, Kentucky.

This species may be readily distinguished from *clausa* and *mitchelliana* by its somewhat triangular aperture, which is more like that of *H. elevata;* it is more elevated, has usually six whirls, more convex, and with deeper suture than in *H. clausa.* In mature shells the inner margin of the peristome, near the columella, has a tooth-like callus, very similar to that often prevailing in forms of *H. exoleta*, *thyroides*, and *albolabris*. The umbilicus is invariably more or less open in *H. clausa*, but closed in *H. pennsylvanica* and *mitchelliana*.

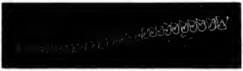
Fig. 238.

Jaw of *Helix pennsylvanica.*

Jaw very arcuate, of uniform width; ends blunt; anterior surface with stout, crowded ribs, denticulating either margin.

Lingual membrane with 120 rows of 29—1—29 teeth each; centrals short, broad, with a conical, acutely-pointed middle cusp, and obsolete side-cusps; laterals of same shape, but bicuspid; uncini large, irregularly denticulated.

Fig. 239.

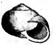


Lingual dentition of *Helix pennsylvanica.*

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
7923	4	Columbus, Ohio.	Dr. J. Lewis.	......
8042	2	....	......	......
8394	3	....	W. G. Binney.	Cab. series.
8767	1	....	W. Stimpson.	......

Helix mitchelliana, Lea.—Shell imperforate, depressed-conoid-globose, thin, with crowded striæ and very crowded decussating microscopic lines, pellucid, horn-color, polished; spire briefly conoid; whirls five, moderately convex, gradually increasing, the last ventricose, subconstricted and briefly deflected anteriorly; aperture diagonal, lunate, subpearlaceous within; peristome white, thickened, its terminations slightly converging, subequally reflected, that of the columella narrow, adherent, or subdilated and spreading. Greater diam. 16½, lesser 14½; height 10 mill.

Fig. 240.



Helix mitchelliana.

Helix mitchelliana, Lea, Am. Phil. Trans. VI, 67, pl. xxiii, f. 71; Obs. II, 87 (1839); Troschel, Arch. f. Nat. 1839, II, 221.—DeKay, N. Y. Moll. 45 (1843).—Pfeiffer, Mon. Hel. Viv. I, 291; IV, 322.—Bland, Ann. N. Y. Lyc. VI, 339 (1858).—W. G. Binney, Terr. Moll. IV, 47.

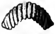
Helix clausa, Binney, Terr. Moll. II, 109; In Vol. III, pl. lv, outline figs.

Mesodon mitchelliana, Tryon, Am. Journ. Conch. III, 45, pl. viii, f. 10 (1867).

Kentucky and Ohio.

Jaw arcuate, of uniform width throughout; ends blunt; anterior surface with crowded, coarse ribs, denticulating either margin.

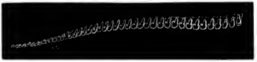
Fig. 241.



Jaw of *Helix mitchelliana.*

Lingual membrane with 136 rows of 42—1—42 teeth each; centrals long, stout, with a long, conical, pointed apex; laterals of same shape, but with an obsolete side-cusp; uncini bidentate, the inner denticle very long, outer uncini with subequal denticles.

Fig. 242.

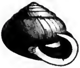


Lingual dentition of *Helix mitchelliana.*

Cat. No	No. of Sp.	Locality.	From whom received.	Remarks.
8032	2	Columbus, Ohio.	Dr. J. Lewis.	......
8037	4	" "	I. A. Lapham.	......
8630	4	" "	Dr. J. Lewis.	Cab. series.
6776	1	Ohio.	......	......

Helix elevata, Say.—Shell imperforate, very convex, elevated, almost conical; epidermis yellowish horn-color; whirls nearly seven, rounded, with fine oblique transverse striæ, the last ventricose; suture distinct; aperture contracted by the peristome, somewhat triangular; peristome white, thickened, reflected, its basal portion with an obsolete, lamellar denticle; parietal wall with a large, white, robust, obliquely-curved tooth; umbilicus covered. Greater diam. 25, lesser 20; height 7 mill.

Fig. 243.



Helix elevata.

Helix elevata, Say, Journ. Acad. Phila. II, 154 (1821); American Conchology, No. 4, pl. xxxvii, f. 2 (1832); Binney's ed. 27, pl. xxxvii, f. 2; ed. Chenu, Bibl. Conch. III, 48, pl. xiii, f. 2, a.—Binney, Bost. Journ. Nat. Hist. I, 490, pl. xix (1837); Terr. Moll. II, 126, pl. iv.—Leidy, T. M. U. S. I, 256, pl. x, f. 4, 5 (1851), anat.—DeKay, N. Y. Moll. 36, pl. iii, f. 20 (1843).—Mrs. Gray, Fig. Moll. An. pl. ccxi, f. 7, no descr.—Pfeiffer, Symb. Hist. Hel. II, 27; Mon. Hel. Viv. I, 317; in Chemnitz, ed. 2, I, 56, pl. vii, f. 11, 12 (1846).—Reeve, Con. Icon. no. 681 (1852).—Deshayes in Fér. I, 329.

Helix tennesseensis, Lea, Trans. Am. Phil. Soc. IX, 1; Obs. IV, 1 (1844); Proc. II, 31 (1841); Troschel's Arch. f. Nat. 1837, II, 124.

Helix knoxvillina, Férussac, Hist. pl. xlix, f. 5, 6.

Xolotrema elevata, Tryon, Am. Journ. Conch. III, 48, pl. ix, f. 1 (1867).

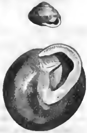
From Georgia to Wisconsin; from New York to Missouri; not east of the Alleghanies. Also in the postpleiocene of the Mississippi Valley.

There is a form furnished with a brownish, revolving band upon the body-whirl.

Cat. No	No. of Sp.	Locality.	From whom received.	Remarks.
8028	3	Banks of Tennessee Riv.	A. Gerhardt.	. ....
8621	2	....	W. G. Binney.	Cab. series.
8747	1	....	......	......
8763	2	....	......	......

Helix clarkii, Lea.—Shell imperforate, globosely-rounded, regularly and finely striated, reddish horn color; spire obtusely conic; whirls seven, convex, with delicate incremental striæ, the last one very globose and rounded below; aperture lunate; peristome white, thickened, reflected, its basal termination quite heavy and covering the umbilicus entirely; one elongated, white denticle on the parietal wall of the aperture. Greater diam. 14, lesser 13; height 9 mill.

Fig. 244.



Helix clarkii, enlarged.

Helix clarkii, Lea, Proc. Acad. Nat. Sci. Philad. 1858, 41; Journ.—; Obs. XI, 138, pl. xxiv, f. 111.—W. G. Binney, Terr. Moll. IV, 53, pl. lxxvii, f. 10.

Xolotrema clarkii, Tryon, Am. Journ. Conch. III 48, pl. ix, f. 2 (1867).

Cherokee County, N. C.; also in Georgia.

The lower figure was photographed on to the wood.

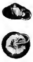
Cat. No	No. of Sp.	Locality.	From whom received.	Remarks.
8830	1	Cherokee County, N. C.	T. Bland.	......
8834	2	Eastern Georgia.	Dr. Jones.	Cab. series.

Helix christyi, BLAND.—Shell imperforate, depressed, rather solid, with numerous oblique rib-like striæ, dark horn-colored; spire short, obtuse; whirls four and a half, rather convex, the last descending at the aperture, slightly angular at the periphery, constricted, above gibbous; base convex, excavated in the middle: aperture depressed, with a strong, oblique, lamelliform parietal tooth; peristome reflected, with a white callus within. Greater diam. 10, lesser 8; height 4½ mill.

Helix christyi, BLAND, Ann. N. Y. Lyc. VII, 117, pl. iv, f. 5, 6, (1860).

Mesodon christyi, TRYON, Am. Journ. Conch. III, 40, pl. vii, f. 11, (1867).

Fig. 245.



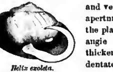
Helix christyi.

Mountains in Cherokee County, N. C.

Cat No.	No. of Sp.	Locality.	From whom received.	Remarks.
8829	1	Cherokee County, N. C.	T. Bland.	......

Helix exoleta, BINNEY.—Shell imperforate, convex, somewhat ventricose; epidermis of a uniform, yellowish-horn, or russet-color; whirls between five and six, with fine, parallel striæ crossing them obliquely; body-whirl large and ventricose; suture well-marked and distinct; aperture rounded, contracted by the peristome, the plane of the aperture making a considerable angle with the plane of the base; peristome thickened, white, reflected, its basal portion subdentate; parietal wall with a prominent, white, oblique tooth; umbilicus covered. Greater diam. 28, lesser 23; height 17 mill.

Fig. 246.



Helix exoleta.

Helix exoleta, BINNEY, Terr. Moll. II, 131, pl. x.—LEIDY, T. M. U. S. 256, pl. x, f. 1–3, anat.—DEKAY, N. Y. Moll. 27, pl. ii, f. 6.—W. G. BINNEY, Terr. Moll. IV, 54.

Helix zaleta, BINNEY, Bost. Journ. Nat. Hist. I, 492, pl. xx.—MRS. GRAY, Fig. Moll. An. pl. excl, f. 9, from Bost. Journ., no descr.—PFEIFFER, Mon. Hel. Viv. I, 316.—DESHAYES in FER. I, 139.—REEVE, Con. Icon. no. 622 (1852).

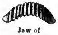
Helix albolabris, var., FERUSSAC, pl. xlvi, a, f. 6.—PFEIFFER, Symb. II, 22 (no descr.); in CHEMNITZ, ed. 2, I, 81, pl. x, f. 19, 20.

Mesodon exoleta, TRYON Am. Journ. Conch. III, 39, pl. vii, f. 8 (1867).

From Western New York and Pennsylvania to Missouri; from Georgia to Illinois. Also in the postpleiocene of the Mississippi Valley.

Jaw narrow, slightly arcuate, somewhat attenuated towards the ends; anterior surface ribbed; both margins denticulated.

Fig. 247.



Jaw of *Helix exoleta.*

The lingual membrane, as figured by Leidy (Terr. Moll. II, 200), is similar to that of *H. albolabris.*

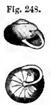
Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks
7920	5	....	W. G. Binney.	......
8903	2	....	"	Cab. series.
8739	1	....	W. Stimpson.	......

Helix wheatleyi, Bland.—Shell imperforate, depressed, conoid-globose, thin, reddish horn-colored, with numerous rib-like striæ, and microscopic granulations with very short hairs; spire shortly conoid; suture deeply impressed; whirls five and a half, rather convex, the last rounded, slightly depressed at the aperture, constricted; base convex, excavated in the umbilical region; aperture oblique, lunate, with a small parietal tooth-like tubercle; peristome acute, rose-colored, equally angularly reflected, appressed at the columella. Greater diam. 14, lesser 12; height 7 mill.

Helix wheatleyi, Bland, Ann. N. Y. Lyc. VII, 118, pl. iv, f. 19 (1860).

Mesodon wheatleyi, Tryon, Am. Journ. Conch. III, 40, pl. vii, f. 10 (1867).

Fig. 248.

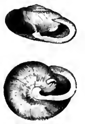


Helix wheatleyi.

Mountains in Cherokee County, North Carolina.

Helix dentifera, Binney.—Shell imperforate, flattened-convex on the upper surface, convex below; epidermis yellowish horn-color, immaculate; spire depressed; whirls five, with delicate, parallel, oblique striæ; suture distinct, not deeply impressed; aperture contracted by the peristome, flattened towards the plane of the base; peristome thickened, white, broadly and abruptly reflected; parietal wall with a prominent, white, tooth-like process nearly parallel with the lower margin of the aperture, not projecting towards the umbilicus; base convex. Greater diam. 23, lesser 18; height 10 mill.

Fig. 249.



Helix dentifera.

Helix dentifera, Binney, Bost. Journ. Nat. Hist. I, 494, pl. xxi (1840); Terr. Moll. II, 134, pl.

xii.—ADAMS, Vermont Mollusca, 159 (1842).—PFEIFFER, Mon. Hel. Viv. I, 317.—W. G. BINNEY, Ter. Moll. IV, 55.—DEKAY, N. Y. Moll. 34, pl. 11, f. 17 (1843).—MRS. GRAY, Fig. of Moll. An. pl. cxci, f. 11, no descr. (from Bost. Journ.).—MORSE, Amer. Nat. I, 99, f. 6, 7 (1867). —Not of PFEIFFER, vol. III.—Not of CHEMNITZ, ed. 2 (= *roëmeri*).

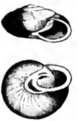
From Maine to Virginia and to Ohio. It prefers mountainous country.

Readily distinguished from the allied species by the very angular and broad reflection of the peristome.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8634	1	Pennsylvania.	W.O. Binney.	Cab. series.

Helix roëmeri, PFEIFFER.—Shell with a narrow, or partially covered umbilicus, sometimes imperforate, depressed, rather thin, closely striated, rather transparent and smooth, horn-colored; spire slightly elevated; suture lightly impressed; whirls five, rather convex, increasing slowly, the last one subcarinate at its periphery, scarcely descending; aperture lunar, oblique, generally slightly contracted by a parietal denticle which obliquely enters the mouth of the shell; peristome white, thickened, the upper portion hardly expanded, reflected below, and at the columellar junction spreading into a thin, partial covering to the umbilicus. Greater diam. 21, lesser 18; height 10 mill.

Fig. 250.



Helix roëmeri.

Helix roëmeri, PFEIFFER in Roëmer's Texas, 455 (1849); Zeitschr. f. Mal. 1848, 117.—REEVE, Con. Icon. no. 680.—W. G. BINNEY, Terr. Moll. IV, 55.

Helix dentifera, part, PFEIFFER, Mon. Hel. Viv. III, 269; in CHEMNITZ, ed. II, 331, pl. cxxxi, f. 1–3, not of BINNEY.

Mesodon roëmeri, TRYON, Am. Journ. Conch. III, 43, pl. viii, f. 4 (1867).

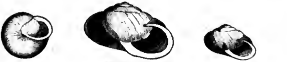
Near New Braunfels, Texas; Washington County and Colorado River, Texas.

This species is confounded by Pfeiffer with *H. dentifera*, an authentic specimen of which he has not seen. It is quite a distinct species, and inhabits a distinct geographical region. It may be distinguished from *dentifera* most readily by attention to the following particulars: Its umbilicus is generally but partially covered, while *dentifera* is always imperforate; its color is lighter, its surface smoother, and, above all, its lip is not so broadly reflected; it is also distinctly subcarinate at the periphery.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8740	2	Texas.	W. G. Binney.	Cab. series.

Helix thyroides, Say.—Shell narrowly umbilicated, depressed globose; spire convex; epidermis of a uniform yellowish-brown or russet color; whorls five, with fine, parallel striæ, running obliquely across them; spire more or less elevated; suture distinctly impressed; aperture lunate, contracted by the peristome, the plane of the aperture making a considerable angle with the plane of the base of the shell; parietal wall with a prominent, white, tooth-like process placed obliquely to the axis of the shell; peristome white, thickened, widely reflected, and sometimes grooved on its face, its exterior yellowish; umbilicus exhibiting only one volution, partially covered by the reflected peristome where it unites with the base of the shell. Greater diam. 22, lesser 19½; height 13 mill.

Fig. 251.



Helix thyroides.

Helix thyroides, Say, Nich. Encycl. (Amer. ed.), 1817. 1818, 1819; Journ. Phila. Acad. I, 123 (1817); American Conchology (1831), No. 2, pl. xiii; ed. Binney, 33, pl. xiii; ed. Chenu, Bibl. 3, 22, pl. iii, f. 3.—Eaton, Zool. Text-Book, 193 (1826).—Ferussac, Hist. pl. xlix, a, f. 4; pl. l, a, f. 6?—Deshayes, Encycl. Méth. II, 230 (1830); in Lam. An. sans Vert. VIII, 114; ed. 3, III, 309; in Fer. I, 209.—Binney, Bost. Journ. Nat. Hist. I, 488, pl. xviii (1837); Terr. Moll. II, 129, pl. xl.—Leidy, T. M. U. S. I, 257, pl. xl, f. 7–9 (1851), anat.—DeKay, N. Y. Moll. 29, pl. ii, f. 8.—Gould, Invertebrata, 171, f. 108 (1841).—Adams, Vermont Mollusca, 159 (1842).—Mrs. Gray, Fig. Moll. An. pl. cccci, f. 6, from Bost. Journ., no descr.

Helix thyroides, Pfeiffer, Mon. Hel. Viv. I, 345; in Chemnitz, ed. 2, I, 331, pl. lviii, f. 8, 9 (1850).—Reeve, Con. Icon. no. 677.—W. G. Binney, Terr. Moll. IV, 53.—Morse, Amer. Nat. I, 98, f. 3 (1867).

Anchistoma thyroides, H. & A. Adams, Gen. pl. lxxviii, f. 3, no descr.

Mesodon thyroides, Tryon, Am. Journ. Conch. III, 41, pl. viii, f. 1 (1867).

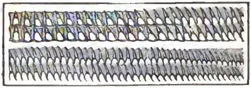
From Canada through all eastern North America, and in the postpleiocene of the Mississippi Valley.

The specimens selected for figuring show the variation in size of the species. The smaller form (from near Philadelphia) is often found imperforate and toothless.

Jaw long, narrow, slightly arcuate, with thirteen stout ribs on both anterior and posterior surface, denticulating the cutting margin.

Teeth of the lingual membrane obtusely conical, surmounted by a long, sharp apex.

Fig. 252.

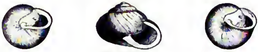


Lingual dentition of *Helix thyroides*. [Leidy]

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
7942	5	St. Simon's Is., Ga.	Dr. J. Lewis.	Local var.
8007	2	Grand Rapids, Mich.	......	......
7994	4	....	W. G. Binney.	......
8008	1	Alabama.	......	......
8009	1	District of Columbia.	W. Stimpson.	......
8010	1	Fort Bridger.	Lieut. Bryan.	......
8025	1	Wisconsin.	I. A. Lapham.	......
8026	4	Texas.	Lieut. Couch.	......
8027	1	Mobile, Ala.	Hamilton.	......
8617	3	....	W. G. Binney.	Cab. series.

Helix bucculenta, Gould.—Shell usually perforate, globose-conic, more or less elevated, rather thin, shining, pale yellowish-green, surface regularly and delicately furrowed by the striæ of growth; whirls five or a little more, rounded, and separated by a well-impressed suture; base convex; aperture rounded; peristome forming nearly two-thirds of a circle, rather broadly reflexed, white, somewhat flesh-colored behind, not completely covering a small umbilical perforation, sometimes entirely covering it; parietal wall sometimes bears a small white tooth at the middle, but oftener not. Greater diam. 18½, lesser 15½; height 10½ mill.

Fig. 253.



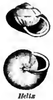
Helix bucculenta.

Helix bucculenta, Gould, Proc. Bost. Soc. Nat. Hist. III, 40 (1848); Terr. Moll. III, 9, pl. xl, b.—Pfeiffer, Mon. Hel. Viv. III, 271; IV, 323.—W. G. Binney, Terr. Moll. IV, 54.

Helix thyroides, β, Pfeiffer, Mon. Hel. Viv. I, 345.—Var., Ferussac, Hist. pl. 1, a, f. 7.

Mesodon bucculenta, Tryon, Am. Journ. Conch. III, 41, pl. viii, f. 2 (1867).

Fig. 254.



Helix bucculenta.

From North Carolina to Texas.

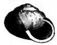
Very nearly allied to, if not identical with *H. thyroides.*

Fig. 254 represents a smaller form of this variable species.

Cat. No	No. of Sp.	Locality.	From whom received.	Remarks.
7933	3	S. W. States?	W. G. Binney.	Imperfor., toothed.
8302	4	Grand Coteau, La.	......	Cab. series.
8739	3	Texas.	W. G. Binney.	"
8808	12	"	"	......
8961		Western Texas.	......	......

Helix clausa, Say.—Shell subimperforate, conoidly-semiglobose, rather solid, with crowded, rib-like striæ, yellowish horn-color; spire subregularly conoid; whirls five and a half, rather convex, gradually increasing, the penultimate subangular, the last rounded, anteriorly subconstricted and briefly deflected; umbilicus narrow, almost covered by the reflected peristome; aperture diagonal, subregularly lunate; peristome with a heavy, white thickening, uniformly subangularly reflected, its columellar portion subdilated. Greater diam. 18½, lesser 16; height 11½ mill.

Fig. 255.



Helix clausa.

Helix clausa, Say, Journ. Phila. Acad. II, 154 (1821); American Conch. (1832), No. 4, pl. xxxvii, f. 1; Binney's ed. 17, pl. xxxvii, f. 1; ed. Chenu, Bibl. Conch. III, 50, pl. xiii, f. 2.—Binney, Bost. Journ. Nat. Hist. I, 482, pl. xv (1837); Terr. Moll. II, 107 (excl. syn.), pl. iv (excepting the outline figures).—DeKay, N. Y. Moll. 31, pl. iii, f. 13 (1843).—Reeve, Con. Icon. f. 694.—Bland, Ann. N. Y. Lyc. VI, 336.—Pfeiffer, Mon. Hel. Viv. IV, 321.—W. G. Binney, Terr. Moll. IV, 46.

Helix pennsylvanica, Pfeiffer, ex parte, Symb. ad. Hist. Hel. II, 36; Mon. Hel. Viv. I, 291; in Chemnitz, ed. 2, II, 51, ex parte.—Reeve, ex parte, Con. Icon. no. 676.

Helix mitchelliana, Pfeiffer in Chemnitz, *l. c.* I, 332, pl. lvi, f. 6–8.

Mesodon clausa, Tryon, Am. Journ. Conch. III, 47, pl. viii, f. 16 (1867).

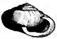
In the States bordering on the Ohio River, and in Wisconsin, Missouri, Tennessee, Mississippi, and Alabama. It is also found in the postpleiocene beds of the Mississippi Valley.

In *H. clausa* the umbilical region is more widely excavated, and the groove, behind the reflected peristome, producing the contraction of the aperture, is continued at the base of the shell, becoming wider as it joins the umbilical opening. In *H. mitchelliana* the groove is almost obliterated at the point of reflection of the peristome over the umbilicus, by the more tumid character of the last whirl.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
7916	1	Mobile, Ala.	Hamilton.	......
7918	1	....	......	Deformed.
7919	2	Alabama.	......	......
8604	4	"	W. G. Binney.	Cab. series.

Helix columbiana, Lea. — Shell umbilicated, subdepressed-globose; epidermis with short, rigid hairs, corneous, thin; whirls six, slightly rounded, very minutely striated, rising gradually, but regularly, one above the other to an acuminated apex; suture strongly impressed; aperture roundly lunate, a little contracted and thickened, by a testaceous deposit or border, at the angle of reflection of the peristome; peristome thickened, whitish, or brownish-white, reflected but not flattened, rather grooved on its face, the basal margin horizontal in its direction, with a slight thickening or projection before it reaches the base of the shell; umbilicus open, partially hidden by the reflected peristome at its junction with the base; base a little flattened. Greater diam. 17, lesser 14; height 11 mill.

Fig. 256.



Helix columbiana.

Helix columbiana, Lea, Am. Phil. Soc. Trans. VI, 89, pl. xxiii, f. 75; Obs. II, 89 (1839); in Troschel, Arch. f. Nat. 1839, II, 221.—DeKay, N. Y. Moll. 46 (1843).—Pfeiffer, Mon. Hel. Viv. I, 343; in Chemnitz, ed. 2, I, 332, pl. lviii, f. 10-12 (1846).—Reeve, Con. Icon. no. 692 (1852).—Binney, Terr. Moll. II, 169, pl. v.—W. G. Binney, Terr. Moll. IV, 16.

Helix labiosa, Gould, Proc. Bost. Soc. Nat. Hist. II, 165 (1846); U. S. Expl. Exped. Moll. 67, f. 35 (1852); Terr. Moll. II, 170, pl. xlii, a, f. 1.—Pfeiffer, Mon. Hel. Viv. I, 343.

Mesodon columbiana, Tryon, Am. Journ. Conch. III, 46, pl. viii, f. 12-14 (1867).

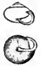
A west coast species, from Sitka and Ft. Simpson (lat. 54° 40′) to Santa Cruz in California (lat. 37° 20′) (*Newcomb*).

Mr. Bland has a specimen with a well-developed parietal tooth.

Cat. No.	No. of Sp	Locality.	From whom received.	Remarks.
8342	6	Fort George.	Com. Wilkes.	......
8344	1	....	......	......
8343	4	Astoria.	Com. Wilkes.	......
8345	2	Oregon City.	......	......
8557	1	Columbia River.	......	Cab. series.

Helix downieana, Bland.—Shell umbilicate, umbilicus nearly covered, subglobose, thin, subpellucid, with obsolete rib-like striæ, decussated with crowded microscopic spiral lines, greenish horn-colored; spire short, obtuse; whirls five, convex, the last tumid, anteriorly somewhat gibbous, scarcely descending, constricted; aperture oblique, lunate oval; peristome white, labiate, reflected, right margin expanded, columellar margin angularly dilated, nearly covering the umbilicus. Greater diam. 10½, lesser 9½; height 6 mill.

Fig. 257.



Helix downieana.

Helix downieana, Bland, Ann. N. Y. Lyc. VII, 420, pl. iv, f. 23, 24 (1861).

Mesodon downieana, Tryon, Am. Journ. Conch. III, 47, pl. viii, f. 15 (1867).

University Place, Franklin County, Tennessee.

Helix jejuna, Say.—Shell umbilicated, subglobose; epidermis corneous, nearly smooth; spire rather prominent; suture impressed; whirls rather more than five, the last ample; striæ of increase hardly visible; peristome white, very narrow, reflected, a deep groove behind it; aperture well rounded, semicircular, considerably contracted by the impressed groove behind the peristome, and a corresponding testaceous deposit, or rib, within; umbilicus small, round, not expanded; umbilical region not impressed; base convex. Greater diam. 8, lesser 7; height 4½ mill.

Fig. 258.

Helix jejuna.

Helix jejuna, Say, Journ. Phila. Acad. II, 158 (1821); Binney's ed. 9.—DeKay, N. Y. Moll. 46.—Pfeiffer, Mon. Hel. Viv. I, 147.—Bland, Ann. N. Y. Lyc. VI, 341 (1858).—W. G. Binney, Terr. Moll. IV, 67.

Helix mobiliana, Lea, Proc. Am. Phil. Soc. II, 82 (1841); Trans. Am. Phil. Soc. IX, 17; Obs. IV, 17 (1844); in Troschel, Arch. f. Nat. 1843, II, 124.—Pfeiffer, Mon. Hel. Viv. I, 323; IV, 122.—Binney, Terr. Moll. II, 172, pl. xlii, f. 2.

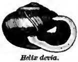
Hygromia jejuna, Tryon, Am. Journ. Conch. II, 308, pl. v, f. 3 (1866).

Georgia, Florida, Alabama.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
5742	1	Georgia.	W. G. Binney.	Cab. series.

Helix devia, Gould.—Shell umbilicated, solid, depressed globose, pale yellowish horn-color, or brown, with fine lines of growth; whirls six, convex, suture well defined; beneath slightly convex, and perforated by a moderate-sized umbilicus, which appears to have an obtuse channel revolving on the whirls within it; periphery rounded; aperture transverse, obliquely lunate; peristome thickened, white, or sometimes rufous, rather broadly reflected, horizontal at base, the inner edge dilated into an elongated, lamellar, white, tooth-like process, and abruptly turning up to form a short columella, where it dilates, and partly surrounds the umbilicus; near the upper margin, and on the parietal wall, is a white trigonal tooth. Greater diam. 24, lesser 19; height 14 mill.

Fig. 259.



Helix devia.

Helix devia, Gould, Proc. Bost. Soc. Nat. Hist. II, 165 (1846); Terr. Moll. III, 11; Moll. of Expl. Exped. 69, f. 74, Addenda, *501 (1852).—Pfeiffer, Mon. Hel. Viv. I, 383.—W. G. Binney, Terr. Moll. IV, 17, pl. lxxix, f. 13.

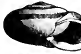
Helix baskervillei, Pfeiffer, Proc. Zool. Soc. 1849; Mon. Hel. Viv. III, 230.—Reeve, Con. Icon. f. 684.

Mesodon devia, Tryon, Am. Journ. Conch. III, 42, pl. viii, f. 3 (1867).

Oregon; Washington Territory.

Helix profunda, Say.—Shell broadly umbilicated, orbicularly depressed; epidermis yellowish horn-color, with reddish-brown, revolving lines and bands, sometimes uniformly brown or albino; whirls from five to six, convex, obliquely striated with delicate and regular raised striæ; suture distinct; aperture almost circular, a little contracted by the peristome, flattened towards the plane of the base; peristome white, thickened, reflected, with a slightly prominent callus, or obtuse tooth, on the inner edge near the base; umbilicus rather large and profound, exhibiting all the volutions to the apex; base convex, with the striæ converging into the umbilicus. Greater diam. 29, lesser 24; height 14 mill.

Fig. 260.



Helix profunda.

Helix profunda, Say, Journ. Phila. Acad. II, 160 (1821); American Conchology, No. 4, pl. xxxvii, f. 3; ed. Binney, 20, 36, pl. xxxvii, f. 3; ed. Chenu, III, 51, pl. xiii, f. 2, b, 2, c.—DeKay, N. Y. Moll. 42, pl. iii, f. 3.—Leidy, T. M. U. S. I, 255, pl. ix, f. 1-3, anat.—Binney, Bost. Journ. Nat. Hist. III, 377, pl. xv; Terr. Moll. II, 177.

pl. xxii.—Pfeiffer, Mon. Hel. Viv. I, 382; in Chemnitz, ed. 2, II, 63, pl. lxxvii, f. 14–16.—Deshayes in Fer. I, 69.—Mrs. Gray, Fig. Moll. An. pl. cxciii, f. 12.—Reeve, Con. Icon. 682.—W. G. Binney, Terr. Moll. IV, 70.

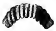
Helix richardi, Ferussac, Tab. Syst. 43; Hist. pl. lxx, three lower figs. —Lamarck, An. s. Vert. VI, 72.—Deshayes, Encycl. Méth. II, 212; in Lam. VIII, 40; ed. 3, III, 283.—Chenu, Ill. Conch. pl. xii, f. 13. —Delessert, Rec. des Coq. pl. xxvi, f. 7.

Junior? Helix bulbina, Deshayes in Fer. Hist. I, 108, pl. lxxxv, f. 14–18. —Pfeiffer, Mon. Hel. Viv. III, 201.—W. G. Binney, Terr. Moll. IV, 116, pl. lxxix, f. 10.

Ulostoma profunda, Tryon, Am. Journ. Conch. III, 37, pl. vii, f. 3, (1867).

Western New York to Wisconsin, Virginia to Kansas. Also in the postpleiocene of the Mississippi Valley.

Fig. 261.

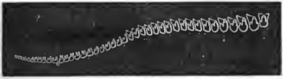


Jaw of *Helix profunda*.

Jaw arcuate, of uniform width, ends blunt; anterior surface crowded with stout ribs, denticulating either margin.

Lingual membrane with 142 rows of 40—1—40 teeth; centrals with a large, stout, obtusely pointed median and two obsolete side-cusps; laterals of same shape, but bicuspid; uncini with irregular, long denticles.

Fig. 262.



Lingual dentition of *Helix profunda*.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
7948	3	Strontian Isl., L. Erie.	W. G. Binney.	Local var.
7949	3	Kansas, n. St Josephs.	......	......
7950	1	Milwaukee, Wis.	I. A. Lapham.	......
7951	2	Illinois.	......	......
8581	2	....	W. G. Binney.	Cab. series.
8582	2	....	"	"

Helix sayii, Binney.[1]—Shell umbilicated, orbicularly-depressed, thin; epidermis light russet, shining; whirls between five and six, with numerous fine, oblique striæ; suture impressed; aperture lunately-subcircular, not dilated; peristome white, narrow, thickened, reflected, with a slightly projecting tooth on the inner edge of the basal portion near the umbilicus; parietal wall with a sub prominent, white tooth; umbilicus open, deep, not wide, exhibiting all the volutions, slightly contracted by the reflected peristome; base rounded, with the striæ distinct, converging into the umbilicus. Greater diam. 27, lesser 23; height 17 mill.

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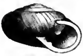
[1] The name *H. sayii* is preoccupied, but Wood gives no description, and even if he did, I should not reject the well-established use of the name for this species. (See p. 89.)

Fig. 263.



Helix sayii.

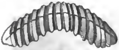
Helix diodonta, SAY, Long's Exped. II, 257, pl. xv, f. 4 (1824); ed. BINNEY, 39, pl. lxxiv, f. 4.—DEKAY, N. Y. Moll. 34, pl. li, f. 18.—DESHAYES in FER. pl. lxix, l, f. 2.

Helix sayi, BINNEY, Bost. Journ. Nat. Hist. III, 379, pl. xvi (1840); Terr. Moll. II, 180, pl. xxiii.—ADAMS, Vermont Mollusca, 160 (1842).—W. G. BINNEY, Terr. Moll. IV, 70.—PFEIFFER, Mon. Hel. Viv. I, 382; in CHEMNITZ, ed. 2, III, 419, tab. cxlviii, f. 13, 14.—LEIDY, T. M. U. S. I, 256, pl. xi, f. 1–4 (1851), anat.—MRS. GRAY, Fig. Moll. An. pl. cxcii, f. 10, from Bost. Journ., no descr.—DESHAYES in FER. I, 79.—REEVE, Con. Icon. no. 679 (1852).—MORSE, Amer. Nat I, 98, f. 4, 5 (1867).

Mesodon sayii, MORSE, Journ. Portl. Soc. I, 9, f. 9, pl. iv, f. 10 (1864).

Ulostoma sayii, TRYON, Am. Journ. Conch. III, 38, pl. viii, f. 4 (1867).

Fig. 264.

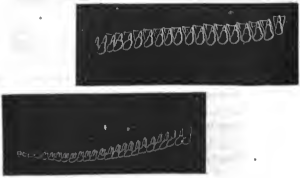


Jaw of *Helix sayii.* [MORSE.]

From Canada East to Michigan and Maryland.

Jaw arcuate, ends somewhat attenuated, blunt; anterior surface with numerous stout ribs, denticulating either margin.

Fig. 265.



Lingual dentition of *Helix sayii.* [MORSE.]

Lingual membrane with 123 rows of 42—1—42 teeth each; centrals long, narrow, with a long, acutely-pointed apex; laterals of same shape as centrals; first uncini short, with two long, coalescing denticles; extreme uncini with three short, obtuse denticles.

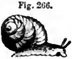
Cat. No.	No. of Sp	Locality.	From whom received.	Remarks.
8034	1	Fleming, Centre Co., Pa.	......	......
8628	1	....	W. G. Binney.	Cab. series.
9190	1	Vermont.	W. Stimpson.	......

SUBGENUS **ACANTHINULA**, Beck.

Shell perforated, globosely turbinated, with a brownish plicately-ribbed or aculeate epidermis; whirls 4–5; aperture rounded; peristome thin, somewhat expanded, its terminations approached.

Animal (of *H. harpa*) small, compared to the size of the shell; body and head slate color, eye-peduncles darker, short, thick; bulbous; eyes large, distinct; foot but two-thirds length of shell, whitish; the body, disk, and mantle are marked with white dots, the edge of the mantle is of the same color as the head and eye-peduncles. The disk is rounded posteriorly, and broad and truncated anteriorly, the lateral borders are deeply crenulated. The head is separate from the disk as in the *Pupinæ*, bearing two minutely crenulated lappets, which hang down on either side of the mouth like a visor, reminding one of the oblique folds on the head of *Glandina truncata*, which we believe to be homologous to them. A longitudinal furrow extends from the mouth downward. The body is so translucent that when extended the ganglionic centres can be plainly seen. In motion they are exceedingly graceful, at times poising their beautiful shell high above their body, and twirling it around, not unlike the *Physa*, again hugging their pretty harp close to their body; the shell, when in this last position, continually oscillates as if the animal could not balance it; it

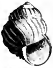
Fig. 266.



Animal of *Helix harpa*.

rarely ever moves in a straight line, but is always turning and whisking about, and this is done at times very quickly and abruptly. (*Morse.*)

Fig. 267.



Helix harpa, enlarged.

Helix (?) harpa, SAY.—Shell subperforate, ovately-conic, transparent, very thin, with coarse, irregular lines of growth, pellucid, light horn-color; spire conical, rather obtuse; whirls four, convex, the upper ones smooth, the two last with prominent, distant, thin, colorless fold-like ribs, slightly inclined backwards, the last whirl rounded, somewhat longer than the spire; columella subreceding; aperture lunately oval; peristome simple, straight, its columellar termination briefly reflected above. Greater diam. 2 mill.; length 3½; aperture 1⅔ long, 1¼ mill. wide.

Helix harpa, SAY, Long's Exped. II, 256, pl. xv, f. 1 (1824); BINNEY's ed. 29, pl. lxxiv, f. 1.

Pupa costulata, MIGHELS, Proc. Bost. Soc. Nat. Hist. I, 187 (1844).

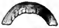
Bulimus harpa, PFEIFFER, Zeitschr. f. Malak. 1847, 147; Mon. Hel. Viv. II, 150; in CHEMNITZ, ed. 2, no. 305, pl. lx. f. 17-19.—REEVE, Con. Icon. no. 536 (1849).—BINNEY, Terr. Moll. II, 290, pl. lii, f. 3.—W. G. BINNEY, Terr. Moll. IV, 135.

Zoögenites harpa, MORSE, Journ. Portl. Soc. I, 32, pl. i, f. 1-14 (1864); Amer. Nat. I, 608, f. 50, 51 (1868).

Helix amurensis, GERSTF., teste MÖRCH.

Gaspé; Maine; New Hampshire. Originally found by Say on the Expedition to St. Peter's River, &c. British America, English River, and James' Bay (*Phil. Proc.* 1861); Sweden (*Mal. Blätt.* 1867, p. 200); Norway, Lapland, &c.

Fig. 268.



Jaw of *Helix harpa*.

Jaw strongly arcuate, of uniform width throughout, ends blunt; anterior surface costate; concave margin indented, with a blunt median projection.

Lingual membrane with 20 rows of 17—1—17 teeth; centrals

Fig. 269.

Lingual dentition of *Helix harpa*.

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tricuspid, median cusp long and slender; laterals same shape, but bicuspid; uncini wide, short, serrated.

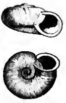
Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8712	2	Maine.	W. G. Binney.	Cab. series.
9086	1	English River.	R. Kennicott.	......
9088	1	James' Bay.	Drexler.	......

Subgenus VALLONIA, Risso.

Shell umbilicated, depressed, diaphanous, whirls 3½–4; aperture oblique, subcircular; peristome white, thickened, reflected, its margins contiguous or converging.

Helix pulchella, Müll.—Shell widely umbilicated, depressed, slightly convex above, thin and transparent; epidermis colorless; whirls four, very minutely striated, the last large, and spreading at the aperture like a trumpet; aperture orbicular, a little dilated; peristome much thickened, white, reflected, making nearly a continuous circle, ends approaching; umbilicus large, exhibiting all the volutions. Greater diam. 3, lesser 2½; height 1½ mill.

Fig. 270.



Helix pulchella, enlarged.

Helix pulchella, Müller, Verm. 30.—Pfeiffer, Mon. Hel. Viv. I, 365.—Binney, Bost. Journ. Nat. Hist. III, 375, pl. ix, f. 2 (1840); Terr. Moll. II, 175, pl. xvii, f. 1.—Leidy, T. M. U. S. I, 256, pl. ix, f. 7–9 (1851), anat.—Gould, Invertebrata, 176, f. 102 (1841).—Adams, Vermont Mollusca, 159 (1842).

Helix minuta, Say, Journ. Phila. Acad. I, 123 (1817); Nich. Encycl. ed. 3 (1819); Binney's ed. 3.—DeKay, N. Y. Moll. 40, pl. iii, f. 33 (1843).—Morse, Amer. Nat. I, 544, f. 39 (1867).

Helix costata, Müller, *vid.* Pfeiffer, Mon. Hel. Viv. I, 366.

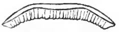
Vallonia minuta, Morse, Journ. Portl. Soc. I, 21, f. 54–56, pl. viii, f. 57 (1864).—Tryon, Am. Journ. Conch. III, 36, pl. vii, f. 26 (1867).

From Canada East to Nebraska and Florida. Also throughout Europe, Siberia, Thibet, Madeira, Azores, &c.

The strongly ribbed variety (*H. costata*) has been found in large numbers in Kansas, and at Cincinnati and Philadelphia.

Jaw long, narrow, slightly bent at the ends, straight in the centre, of uniform width throughout; ends

Fig. 271.

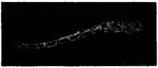


Jaw of *Helix pulchella*. [Morse.]

blunt; anterior surface with vertical ribs; concave margin minutely notched.

Lingual membrane with 75 rows of 11—1—11 teeth each; centrals very small, broad, obtuse, tricuspid; laterals long, bicuspid; uncini short, broad, serrated.

Fig. 272.



Lingual dentition of *Helix pulchella*. [MORSE.]

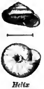
Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
7912	38	Kansas.	......	......
7913	1	Apple Creek.	......	......
7914	14	Halifax, N. S.	......	......
7957	2	Marietta, Ohio.	W. Holden.	......
8767	100	New York.	Dr. J Lewis.	Cab. series.
8768	100	Kansas	......	"
8783	100	Massachusetts.	W. Stimpson	......

SUBGENUS **FRUTICICOLA**, Held.

Shell umbilicated or perforated; depressed-globose, sometimes pilose; whirls 5–7, rather convex; aperture broadly lunate or lunate-rounded, peristome acute, very briefly expanded, labiate within, its basal margin reflexed.

Helix hispida, LINN.—Shell openly umbilicated, suborbiculately-depressed, horn-color, shining, with short hairs; spire convex; whirls five to six, rather convex, narrow; aperture broadly lunate; peristome spreading, thickened with white within, its basal terminus more narrow, prominent, and acute. Greater diam. 10, lesser 9; height 5½ mill.

Fig. 273.



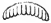
Helix hispida.

Helix hispida, LINNÆUS, Syst. 675, &c. &c.—PFEIFFER, Mon. Hel. Viv. I, 148.

Hygromia hispida, TRYON, Am. Journ. Conch. II, 308, pl. v, f. 2 (1866).

This is an European species, which has been found at Halifax, N. S., probably accidentally introduced from England.

Fig. 274.



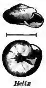
Jaw of *Helix hispida.*

Moquin-Tandon figures the jaw of a French specimen as slightly arcuate; ends rounded, somewhat attenuated; anterior surface with numerous ribs, denticulating the concave margin.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
7944	42	Halifax, N. S.	......	Introd. from Europe.
8587	6	" "	......	Cab. series. Introd. [from Europe.
9188	20	Nova Scotia.	......	

Helix rufescens, Pennant.—Shell umbilicated, subglobose-depressed, subcarinate, striate, pale reddish; spire moderately elevated; whirls six, rather convex, the last banded with white, not deflected anteriorly; aperture ovate-lunar; peristome spreading, thickened with white at some distance within, the columellar margin somewhat reflected. Greater diam. 11, lesser 10, height 6 mill.

Fig. 275.



Helix rufescens.

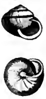
Helix rufescens, Pennant, &c. &c.—Pfeiffer, Mon. Hel. Viv. I, 141.

Hygromia rufescens, Tryon, Am. Journ. Conch. II, 301, pl. v, f. 1 (1866).

Germany, England, and other European countries. Also found at Quebec, probably introduced from England.

Helix berlandieriana, Moricand.—Shell perforated, globose, thin and translucid, scarcely striated, shining, and with a somewhat silken or opaline lustre, pale yellowish-green, sometimes nearly colorless and generally having a faint, narrow, brownish band around the posterior third of the last whirl; spire consisting of five well rounded whirls, separated by a deeply impressed suture, the last whirl broadly rounded at the periphery; contracted at the aperture, which is small, crescentic, with a white, polished, roundly reflexed peristome, presenting a sharp, inner edge to the interior; the peristome is somewhat angular near its posterior junction, and at this part the shell is thickened within with caline, and is opaque white; base rounded, and perforated by a minute umbilicus. Greater diam. 13, lesser 10; height 8 mill.

Fig. 276.



Helix berlandieriana.

Helix berlandieriana, Moricand, Mém. de S. Phys. et d'Hist. Nat. de Genève, VI, 537, pl. i, f. 1 (1833).—Deshayes in Lam. An. sans Vert. VIII, 133; ed. 3, III, 316.—Leidy, T. M. U. S. I, 255, pl. viii, f. 11 (1851), anat.—Binney, Terr. Moll. II, 109, pl. xiix, f. 1.—W. G. Binney, Terr. Moll. IV, pl. lxxvii, f. 22.—

Pfeiffer, Mon. Hel. Viv. III, 227 (not I); in Chemnitz, ed. 2, II, 275, pl. cxxiii, f. 15–18.—Reeve, Con. Icon. no. 708 (1852).

Helix pachyloma, Menke in Pfeiffer, *l. c.* I, 323; Zeitschr. f. Mal. 1847, IV, 32.

Helix virginalis, Pfeiffer, Mon. Hel. Viv. III, 132; I, 165 as *berlandieriana*; IV, 140; in Chemnitz, ed. 2, I, 260, pl. xxxviii, f. 18, 19.

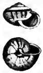
Hygromia berlandieriana, Tryon, Am. Journ. Conch. II, 309, pl. v, f. 4 (1867).

Arkansas, Texas, and the neighboring portions of Mexico.

Cat. No	No. of Sp.	Locality.	From whom received.	Remarks.
8000	6	Tamaulipas, Mex.	Lieut. Couch.	......
8001	1	Texas.	O. Wurdemann.	......
8002	1	"	......	= *H. virginalis?*
8660	3	Indianola, Tex.	Lieut. Couch?	Cab. series.
9164	1	Chapatilo, Mex.	......	......

Helix griseola, Pfr.—Shell umbilicated, depressed-globose, obliquely striate, shining, grayish, banded with red, white-margined stripes; spire short; whirls four to four and a half, rather convex; umbilicus very narrow; aperture lunar; peristome simple, white, reflected somewhat, its columellar end rather expanded. Greater diam. 10, lesser $8\frac{2}{3}$; height 6 mill.

Fig. 277.



Helix griseola.

Helix griseola, Pfeiffer, Symb. Hist. Hel. I, 41; Mon. Hel. Viv. I, 337; in Chemnitz, ed. 2, I, 342, pl. lx, f. 17. 18.—Reeve, Con. Icon. no. 327 (1852).—W. G. Binney, Terr. Moll. IV, 50, pl. lxxvii, f. 20.

Helix cicercula, Ferussac in Mus., teste Pfeiffer.

Helix splendidula, Anton, Verz. 36, no descr., teste Pfeiffer.

Helix albocincta, Binney, Terr. Moll. I, 128.

Helix albozonata, Binney in tab. xlix, f. 2.

Helix berlandieriana, Gould, part, in Terr. Moll. II, 109.

Helix albolineata, Gould, Terr. Moll. III, 34.

Hygromia griseola, Tryon, Am. Journ. Conch. II, 309, pl. v, f. 5 (1867).

Texas to Vera Cruz, Mexico.

Cat. No.	No. of Sp.	Locality	From whom received.	Remarks.
7941	2	Tamaulipas, M.	Lieut. Couch.	......
8047	3	Texas.	"	......
8580	2	"	"	Cab. series.

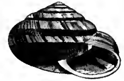
SUBGENUS **AGLAIA**, Albers.

Shell umbilicate, orbicularly convex, striatulate, banded; whirls $4\frac{1}{2}$–6, the last deeply deflexed in front; aperture lunate-ovate, very oblique; peristome thickened, expansively reflexed, white, its margins approaching, that of the columella dilated, reflexed, free, partially covering the umbilicus.

Animal (of *H. fidelis*): color dull ochre, slaty towards the tail; coarsely granular upon the neck; but from a line running from the dorsal line, where it issues from the shell, to the mouth, the granules diminish, and are succeeded by coarse, undulating, interrupted ridges, radiating in every direction from the aperture, and terminating in a line nearly marginal; edge simple.

Helix fidelis, GRAY.—Shell umbilicated, orbicularly subconoid; epidermis light yellow or brownish on the upper surface, with a black or chestnut colored, revolving band visible on the four outer whirls, the lower surface dark chestnut, sometimes uniformly black; suture distinct, impressed; whirls seven, rounded, spirally striate, with minute, delicate, impressed lines, the striæ of increase very distinct; peristome reflected below, simple above, thickened; aperture ovate, banded within; umbilicus open, a little contracted by the reflection of the peristome; base flattened-convex. Greater diam. 34, lesser 30; height 20 mill.

Fig. 278.



Helix fidelis.

Helix fidelis, GRAY, Proc. Zool. Soc. July, 1834, 67.—PFEIFFER, Mon. Hel. Viv. I, 338; in CHEMNITZ, ed. 2, i, 321, pl. lvii, f. 12–13.—MULLER, Syn. Test. anno 1834 promulg., 8 (1836).—REEVE, Con. Icon. no. 657 (1852).—W. G. BINNEY, Pac. R. R. Rep. VI, 111 (1857); Terr. Moll. IV, 14.

Helix nuttalliana, LEA, Am. Phil. Trans. VI, 88, pl. xxiii, f. 74; Obs. ii, 88 (1839); TROSCHEL, Arch. f. Nat. 1839, ii, 229.—BINNEY, Bost. Journ. Nat. Hist. iii, 369, pl. xii (1840); Terr. Moll. II, 159, pl. xviii.—DEKAY, N. Y. Moll. 46 (1843).—GOULD, U. S. Expl. Exped. Moll.* 66, f. 38 (1852).

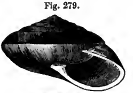
Aglaja fidelis, TRYON, Am. Journ. Conch. ii, 311, pl. v, f. 8 (1866).

Humboldt Bay, Cal., to Vancouver's Island, Oregon. From Mt. Shasta the specimens are half as large as usual.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8329	2	Puget Sound.	Com. Wilkes.	......
8330	12	Columbia River.	"	......
8331	1	Esquimalt Harb., Vanc. Isl.	......	......
8332	2	Umpqua Valley, Or.	......	......
8333	3	Fort Stillicoa.	......	......
8334	3	Puget Sound.	Com. Wilkes.	......
8335	1	Nisqually, Puget Sd.	......	......
8336	2	Straits of Fuca, W. T.	......	......
8337	1	....	Com. Wilkes.	......
8338	3	Puget Sound.	O. Gibbs.	......
8339	2	Oregon City.	Dr. B. F. Shumard.	......
8340	3	San Francisco.	......	......
8341	3	Fort Stillicoa.	......	......
8454	2	Puget Sound.	Com. Wilkes.	In alcohol.
8455	2	Chilowaypuck, W. T.	A. Campbell.	"
4710	5	Puget Sound.	"	"
8457	4	" "	......	"
8458	4	....	A. Campbell.	"
8547	4	Columbia River.	......	Cab. series.

Helix infumata, GOULD.[1]—Shell umbilicated, large, discoidal, biconvex, obtusely carinated at the periphery, widely umbilicated, smoky above, roughened with minute, oblique, rasp-like irregularities, below very black, shining and minutely granulated; whirls six and a half, convex; aperture rhomboidal; peristome reddish, somewhat reflected at base; throat silky-lilac, near the peristome smoky. Diam. 37, height 20 mill.

Fig. 279.

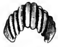


Helix infumata.

Helix infumata, GOULD, Proc. Bost. Soc. V, 127 (1855); Terr. Moll. III, 13.—W. G. BINNEY, Pac. R. R. Rep. VI, 112 (1857); Terr. Moll. IV, 15, pl. lxxix, f. 2.—PFEIFFER, Mon. Hel. Viv. IV, 351.

Aglaja infumata, TRYON, Am. Journ. Conch. II, 310, pl. v, f. 6 (1867).

Fig. 280.



Jaw of *Helix infumata.*

California, from Humboldt's Bay to San Pablo Bay.

Jaw very arcuate, of uniform width throughout; ends square; anterior surface with crowded, stout ribs, denticulating either margin.

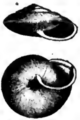
Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8328	1	California.	Dr. J. S. Newberry.	......
8358	1	San Francisco.	Dr. Bigelow.	Type. Cab. series.

---

[1] The last whirl is covered with very short, thickly-studded soft hairs. (*Newcomb.*)

Helix hillebrandi, Newcomb.—Shell umbilicated, biconvex, orbicularly depressed, carinated; yellowish horn-color, with a chestnut band within two white ones, showing only in the aperture, granulated, finely striate and hirsute; spire subpyramidal; whirls six, slightly convex, the last carinated at its middle, inflated below, slightly descending; aperture oblique, lunate, subangulate, white and banded within; peristome white, thickened, reflected, partially concealing the open umbilicus, ends approached. Greater diam. 25, lesser 19; height 10 mill.

Fig. 281.



Helix hillebrandi.

Helix hillebrandi, Newcomb, Proc. Cal. Acad. Nat. Sci. III, 115, 181 (1864).

Aglaja hillebrandi, Tryon, Am. Journ. Conch. II, 310, pl. v, f. 7 (1866).

Tulumne Co., California.

The specimen figured is from Dr. Newcomb.

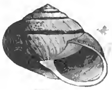
Subgenus **ARIONTA**, Leach.

Shell umbilicately-perforate, conic- or depressed-globose, thin; whirls 5–6, the last gradually descending; aperture lunate-rotund; peristome broadly labiate, its margins parallel, the basal dilated, often covering the umbilicus.

Animal (of *H. townsendiana*) corpulent, gradually tapering; color pale yellowish-green; surface with rather sparse, feebly-developed, elliptical granules, not seeming to have any regular arrangement; margin of disk rather broad, granulated, but regularly marked with radiating furrows.

Helix arrosa, Gould.—Shell globose conic, thick, umbilicated, indented, and minutely granulated; color reddish-olive, varied with yellow, and with a fuscous revolving band; whirls seven, convex; aperture roundly ovate; peristome reflected, flesh-colored; throat bluish. Diam. 40, height 18 mill.

Fig. 282.



Helix arrosa.

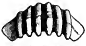
Helix æruginosa, Gould, Proc. Bost. Soc. V, 127 (1855); Terr. Moll. III, 12.—W. G. Binney, Pac. R. R. Rep. VI, 113 (1857).

Google

Helix arrosa, GOULD, in litt.; Otia, 215.—W. G. BINNEY, Proc. Acad. Nat. Sci. Philad. 1857, 185; Terr. Moll. IV, 15, pl. lxxvi, f. 4.—PFEIFFER, Mon. Hel. Viv. IV, 350.

Aglaja arrosa, TRYON, Am. Journ. Conch. II, 311, pl. v, f. 10 (1867).

Fig. 283.



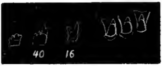
Jaw of *Helix arrosa*.

California; Santa Cruz to Mendocino County (*Cooper*).

Jaw arcuate, of uniform breadth throughout; ends blunt; anterior surface with a few (six) rather distant, stout ribs crenulating both margins.

Lingual membrane with 180 rows of 54—1—54 teeth each; centrals long, conical, with a conical apex, laterals of same shape; uncini large, irregularly denticulated or obtusely serrated.

Fig. 284.

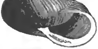


Lingual dentition of *Helix arrosa*.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8348	1	California.	……	……
8349	1	Columbia River.	……	……
8555	1	San Francisco.	……	Cab. series.
8556	1	" "	……	Var. β. Cab. series.
9246	2	Petaluma.	Dr. Newberry.	……
9247	3	"	"	……
9324	20	Near San Francisco.	Rev. J. Rowell.	……

Helix townsendiana, LEA.—Shell umbilicated, depressed-globose; epidermis yellowish and brownish horn-color, more or less intermixed; suture distinct; whirls five and a half, with minute, impressed, longitudinal striæ, which can scarcely be traced by the eye, and coarse, oblique wrinkles and striæ; body-whirl large, voluminous, rough, and corrugated; aperture rather large, somewhat rounded; peristome white, fully reflected at the base, and but partially so towards its superior part, thickened and a little projecting internally in the base of the aperture; umbilicus open, deep, a little contracted by the reflection

Fig. 285.



Helix townsendiana.

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of the peristome; base convex and turgid. Greater diam. 29, lesser 24; height 16 mill.

Helix townsendiana, Lea, Trans. Am. Phil. Soc. VI, 99, pl. xxiii, f. 80 (1840); Obs. II, 99 (1839); in Troschel's Arch. f. Nat. 1839, II, 221.—Binney, Bost. Journ. Nat. Hist. III, 371, pl. xiii; Terr. Moll. II, 161, pl. xix.—DeKay, N. Y. Moll. 46 (1843).—Pfeiffer, Mon. Hel. Viv. I, 341; in Chemnitz, ed. 2, I, 323, pl. lvii, f. 10, 11 (1846).—Reeve, Con. Icon. 625 (1852).—Gould, U. S. Expl. Exp. Moll. 66, f. 36 (1852).—W. G. Binney, Terr. Moll. IV, 15.—Bland, Ann. N. Y. Lyc. VII, 362.

Mesodon townsendiana, Tryon, Am. Journ. Conch. III, 46, pl. viii, f. 7 (1867).

Helix pedestris, Gould formerly, see Otia, 243.

Helix ruida, Gould formerly.

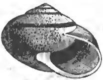
Washington Territory; Crescent City, California; Montana (*Cooper*).

A small variety (17 mill. diam.) is found, more strongly and coarsely wrinkled.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8359	4	Nisqually, Puget Sound.	......	Albino.
8360	1	Chiloneyuck Dep., Puget	A. Campbell.	......
8361	5	Puget Sound.	......	......
8362	1	" "	......	Albino.
8363	1	De Fuca.	......	......
8364	1	Puget Sound.	Com. Wilkes.	......
8365	18	Oregon?	"	......
4290	9	Columbia River	"	Alcoholic.
8456	2	Chiloneyuck, W. T.	N. W. Bound. Surv.	"
8544	2	Puget Sound.	A. Campbell	Cab. series.
8545	1	" "	Dr. C. B. Kennerly	"
9318	4	R. of Ft. Colville, W. T.	N. W. Bound. Surv.	......

Helix tudiculata, Binney.—Shell subumbilicated, orbiculato-convex; epidermis olivaceous; spire a depressed cone; whirls between five and six, slightly convex; body-whirl voluminous, expanding somewhat towards the aperture; aperture transverse, rather circular; peristome whitish, thin, expanded, slightly reflected at the basal portion, at the columella dilated, reflected, and almost closing the umbilicus; base convex; a well-defined, rather wide, dark chestnut band, margined with a light color above and below, revolves near the centre of the body-whirl, and is more or less visible above the suture on the two whirls preceding the last; surface of the outer whirl covered with somewhat regular impressions or indentations with ridges between, causing it to look

Fig. 286.



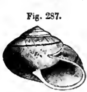
Helix tudiculata.

as if covered with scales; when these are not apparent, it is marked with oblique wrinkles. Greater diam. 33, lesser 26; height 19 mill.

Helix tudiculata, Binney, Bost. Journ. Nat. Hist. IV, 360, pl. xx (1843); Terr. Moll. II, 118, pl. xvi.—Pfeiffer, Mon. Hel. Viv. I, 283; IV, 270.—W. G. Binney, Terr. Moll. IV, 7.

Aglaja tudiculata, Tryon, Am. Journ. Conch. II, 313, pl. v, f. 13 (1867).

Fig. 287.



Helix cypreophila.

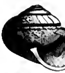
California, at San Diego, to Washington Territory.

I have lately received this species under the name of "*H. cypreophila*, Newc., Copperopolis, Cal.," from Dr. Newcomb, one of whose specimens is here figured.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
3568	3	San Diego, Cal.	Lieut. Ives.	......
6551	2	" "	"	Cab. series.

Helix nickliniana, Lea.—Shell subumbilicated, conic-globose, rather thin, the surface lightly marked by the lines of growth, faintly indented and delicately shagreened with fine microscopic granules arranged in quincunx; pale horn-color or sometimes cinereous, girdled with a single narrow chestnut bronze zone, paler at its edges; the whole covered with a thin, yellowish-brown epidermis; spire elevated, whorls six, moderately convex, the outer one ventricose, with some approach to an angular periphery; base tumid, depressed at centre, and perforated by a very small umbilicus; aperture rounded, forming two-thirds of a circle, banded within; peristome white, slightly reflected above, more so below, until at the umbilicus it is quite revolute, and mostly covers the opening. Greater diam. 28, lesser 23; height 19 mill.

Fig. 288.



Helix nickliniana.

Helix nickliniana, Lea, Trans. Am. Phil. Soc. VI, 100, pl. xxiii, f. 84; Obs. II, 100 (1839); Troschel, Arch. f. Nat. 1839, II, 221.—Binney (pars), Terr. Moll. II, 119, pl. vi, a.—W. G. Binney, Terr. Moll. IV, 7.—Pfeiffer, Mon. Hel. Viv. IV, 269.

Helix californiensis, Pfeiffer, Mon. Hel. Viv. I, 339; III, 229; in Chemnitz, ed. 2, 332, pl. lvii, f. 14–15, excl. var. 2 (1846).—Reeve, Con. Icon. no. 661.—Not of Lea.

Helix arboretorum, Valenciennes, Voy. de la Venus, Moll. pl. i, f. 3 (see Terr. Moll. IV, pl. lxxvi, f. 13).

Helix nemorivaga, Valenciennes, *l. c.* f. 1 (see Terr. Moll. pl. lxxix, f. 11).

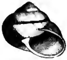
Helix anachoreta, W. G. Binney, Proc. Acad. Nat. Sci. Philad. 1857, 185; Terr. Moll. IV, 11, pl. lxxvi, f. 5.—Pfeiffer, Mon. Hel. Viv. IV, 349.
Aglaja nickliniana, Tryon, Am. Journ. Conch. II, 312, pl. v, f. 12 (1867).
Aglaja anachoreta, Tryon, Am. Journ. Conch. II, 311, pl. v, f. 9 (1867).

California, Santa Cruz to Mendocino Co. (*Cooper*).

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8353	3	San Francisco.	Dr. Bigelow.	......
4424		....	......	......
4259	4	California.	......	Animals of these in alcohol. *Vid.* 8461.
8461	28	"	......	Alcohol. 8 ex's without shell.
8348		"	......	Cab. series. Animal
8719	1	San Francisco.	Rowell.	....[with last.
8721	3	"	"	Vars.
9245	1	Tomales, Cal.	Dr. Newberry.	......

Helix redimita, W. G. Binn.—Shell imperforate, globose-conic, rather thin, wrinkled, covered with minute and crowded granulations; color reddish-brown; apex free from granules, rather blunt; spire elevated; suture impressed; whirls six, convex, the last quite large and rounded, falling towards the aperture, and banded with reddish-brown above the middle; aperture rather large in proportion to the size of the shell, very oblique, transversely rounded, within showing the band; peristome simple, reddish-ash color, thickened, reflected slightly at the base, ends approached; umbilicus entirely covered with a white callus. Greater diam. 31, lesser 17; height 12 mill.

Fig. 289.



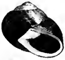
Helix redimita.

Helix redimita, W. G. Binney, Proc. Acad. Nat. Sci. Philad. 1857, 183; Terr. Moll. IV, 10.—Pfeiffer, Mon. Hel. Viv. IV, 349.
Helix nickliniana, var., Binney, Terr. Moll. III, pl. vi, f. 1 (except middle figure).
Polymita redemita, Tryon, Am. Journ. Conch. II, 320, pl. vi, f. 7 (1867).

San Clemente Island, California.
May it not prove a less developed form of *H. intercisa?*

Helix intercisa, W. G. Binn.—Shell globose-conic, with five slightly rounded whirls; spire little elevated; suture distinct; upon the body-whirl a dark revolving band, hardly discernible; aperture very oblique, shape of a horseshoe; peristome thickened, heavy, dirty white, slightly reflected at the umbilicus, which it entirely conceals, near its junction with the columella furnished with a tooth-like process, the extremities connected by a heavy ash-colored callus, which is spread more lightly

Fig. 290.



Helix intercisa.

over the whole parietal wall; epidermis grayish-yellow, apex rufous; the striæ of growth are very numerous and distinct, crossed by numerous, regular, revolving lines, so deeply impressed as to entirely separate them into small sections; thus the whole surface of the shell is divided into minute, raised parallelograms, separated by the deep longitudinal and horizontal furrows. Greatest diam. 22, lesser 19; height 15 mill.

Helix intercisa, W. G. BINNEY, Proc. Acad. Nat. Sci. Philad. 1857, 18; Proc. Bost. Soc. Nat. Hist. VI, 156 (1857); Terr. Moll. IV, 8.—PFEIFFER, Mon. Hel. Viv. IV, 349.

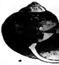
Helix nickliniana, var., BINNEY, Terr. Moll. II, 120; III, pl. vi, f. 1 (middle figure).

Helix crebristriata, NEWCOMB, Proc. Cal. Acad. Nat. Sci. III, 116.

Polymita intercisa, TRYON, Am. Journ. Conch. II, 319, pl. vi, f. 4 (1867).

Arionta crebristriata, TRYON, *l. c.* II, 317, pl. vi, f. 2 (1867).

Fig. 291.



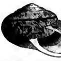
Helix crebristriata.

This species, until quite recently known only by the single specimen in Dr. Binney's collection, supposed to be from Oregon, has recently been described from San Clemente Island, California, under the name of *H. crebristriata*, by Newcomb, one of whose specimens is here figured. An apparently semi-fossil form occurs, with thick shell, heavy, rough growth beyond the peristome, which is made continuous by its ends being joined by a very solid, raised callus.

Cal. No.	No. of Sp.	Locality.	From whom received.	Remarks.
9348	3	....	Dr. J. G. Cooper.	(*H. crebristriata*, (Newc., type.)

Helix exarata, PFEIFFER.—Shell umbilicated, depressed-conic, rather solid, malleated and wrinkled, yellowish, with one chestnut band; spire rather acute, conic; whirls seven, equally convex, gradually increasing, the last broader, rounded, scarcely falling in front, narrowed around the open, moderate umbilicus; aperture oblique, broadly lunate; peristome with a light white thickening, the terminations scarcely converging, the right slightly expanded, the columella triangularly dilated above and widening. Greater diam. 30, lesser 25; height 16 mill.

Fig. 292.



Helix exarata.

Helix exarata, PFEIFFER, Proc. Zool. Soc. 1857, 108; Mon. Hel. Viv. IV, 268.—W. G. BINNEY, Terr. Moll. IV, 12.

Aglaja exarata, TRYON, Am. Journ. Conch. II, 312, pl. v, f. 11 (1867).

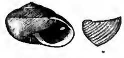
California.

The shell figured I believe to be this species. It is from near San Francisco.

Cat No.	No. of Sp.	Locality.	From whom received.	Remarks.
9323	15	Near San Francisco.	Rowell.	……

Helix reticulata, Pfeiffer.—Shell umbilicate, depressed globose, solid, obliquely striated, and marked with oblong, somewhat regular granulations formed by striæ descending towards the anterior part; yellowish with one revolving reddish band; spire shortly conic; whorls five and a half somewhat convex, the last broad, rounded, not falling in front; umbilicus narrow, not pervious; aperture diagonal, roundly lunate; peristome white, thickened, its ends not converging, the right scarcely expanded, the columellar sloping, dilated above and reflected. Greater diam. 22, lesser 18; height 11½ mill.

Fig. 293.



Helix reticulata.

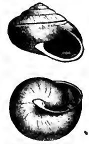
Helix reticulata, Pfeiffer, Mal. Blatt. 1857, 87; Mon. Hel. Viv. IV, 270; Nov. Conch. I, 120, pl. xxxiv, f. 47.—W. G. Binney, Terr. Moll. IV, 12.

Aglaja reticulata, Tryon, Am. Journ. Conch. II, pl. vi, f. 18 (1866), no desc.

Helix bridgesii, Newcomb, Proc. Cal. Acad. Nat. Sci. II, 91 (1861).

Aglaja bridgesii, Tryon, Am. Journ. Conch. II, 313, pl. xi, f. 29 (1866).

Fig. 294.



Helix bridgesii.

Los Gatos, California.

The figure is a fac-simile of one of Pfeiffer's.

Specimens of Helix bridgesii received from Dr. Newcomb resemble forms of *H. reticulata* so closely that I believe the two to be identical. An authentic specimen, loaned by Dr. Newcomb, is figured here.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
9335	1	Contra Costa Co.	Dr. J. G. Cooper.	……

Helix ramentosa, Gould.—Shell perforate, suborbicular, depressed, thin, reddish, with a smoky, white-margined band revolving at the periphery; granulated with incremental lines and equally oblique, decussating furrows; whirls five and a half, rather convex, the last obtusely angulated; suture deeply impressed; aperture obliquely oblong-ovate; peritreme acute behind, white, decidedly reflected towards the umbilicus; throat reddish. Greater diam. 20, height 12 mill.

Helix ramentosa, Gould, Proc. Bost. Soc. Nat. Hist. VI, 11 (1845); Terr. Moll. U. S. III, 12.—Pfeiffer, Mon. Hel. Viv. IV, 349.—W. G. Binney, Terr. Moll. IV, 13.

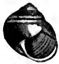
Aglaja ramentosa, Tryon, Am. Journ. Conch. II, 314, pl. v, f. 15 (1862).

California; Napa Co. to Santa Clara Co. (*Cooper*).

I am unacquainted with this species, which will perhaps prove identical with the more recently described *H. reticulata*.

Helix californiensis, Lea.—Shell subperforate, ventricose, subglobular, thin and transparent, shining, delicately indented and granulated, faintly but regularly striate, of a pale yellowish horn-color, minutely flecked with pale spots and girded by a narrow brown band, paler at its edges; spire elevated, whirls five, convexly rounded, the last very broad, vesicular; base ventricose; aperture subcircular, silky and banded within; the peristome slightly reflected, thickened within, more everted towards its columellar margin, where it is roundly reflected, nearly covering a very small umbilical perforation. Greater diam. 19, lesser 16; height 15 mill.

Fig. 295.



Helix californiensis.

Helix californiensis, Lea, Trans. Am. Phil. Soc. VI, 99, pl. xxiii, f. 79; Obs. II, 99 (1839); Troschel in Wiegm. Arch. 1839, II, 221.—Binney, Terr. Moll. II, 121, pl. vi, f 2.—W. G. Binney, Terr. Moll. IV, 13.—DeKay, N. Y. Moll. 46 (1843), not of Pfeiffer,(?) Chemnitz, Reeve.

Helix vincta, Valenciennes, Voy. de la Venus, Moll. pl. 1, f. 2, no descr. —Reeve, Con. Icon. no. 660.—Pfeiffer, Mon. Hel. Viv. III, 183; IV, 269; in Chemnitz, ed. 2, II, 487, t. cix, f. 2 (1854).

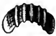
Arionta californiensis, Tryon, Am. Journ. Conch. II, 317, pl. v, f. 20 (1866).

San Francisco; San Diego, California.

Readily distinguished by its thin, delicate shell and globose form.

Jaw arcuate, of uniform width throughout; ends blunt; anterior surface with only four distant, stout ribs, crenulating either margin.

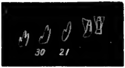
Fig. 296.



Jaw of *Helix californiensis.*

Lingual membrane with 176 rows of 56—1—56 teeth; centrals and laterals long, obtusely pointed; uncini long, with two or three denticles.

Fig. 297.

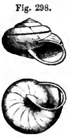


Lingual dentition of *Helix californiensis.*

Cat. No	No. of Sp.	Locality.	From whom received.	Remarks.
8346	1	Interior of California.	Com. Wilkes.	......
8347	3	Point Cypress, Monterey.	C. A. C.	......
3294	2	Monterey.	Trowbridge.	Cab. series.

Helix carpenteri, Newcomb.—Shell umbilicated, roundly conical, apex obtuse, obscurely marked with one brown band, well striated, under the lens numerous very minute spiral striations; whirls five and a half, rounded; suture well marked; aperture circular, with terminations approximating; peristome moderately expanded, at the columella broadly so, but not adherent. Greater diam. 23, height 16½ mill. (*Newcomb.*)

Fig. 298.



Helix carpenteri.

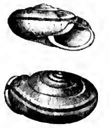
- *Helix carpenteri*, Newcomb, Proc. Cal. Acad. Nat. Sci. (March, 1861), II, 103.
- *Aglaja carpenteri*, Tryon, Am. Journ. Conch. II, 313 (1866).
- *Helix remondi*, Tryon, Proc. Acad. Nat. Sci. Philad. 1863, 281, pl. ii, f. 1.
- *Arionta remondi*, Tryon, Am. Journ. Conch. II, 318, pl. v, f. 18 (1866).

Cinaloa (*Tryon*); Trinidad, Lower California (*Gabb*); Tulare Valley (*Newcomb*).

The shell figured was received from Dr. Newcomb.

Helix mormonum, Pfeiffer.—Shell umbilicated, depressed, rather thin, with arching striæ, light red; spire scarcely elevated-conic; whirls six, slightly convex, gradually increasing, the last convex above and below, rather swollen before, scarcely falling, ornamented above the middle with a chestnut band doubly edged with white, convex below; umbilicus moderate, conical; aperture very oblique, ear-shaped, lunate; peristome with a white thickening, its ends converging, the right very much arched, expanded, the columellar curved and sloping, reflected, expanded above. Greater diam. 29, lesser 24½; height 12½ mill.

Fig. 299.



Helix mormonum.

Helix mormonum, Pfeiffer, Proc. Zool. Soc. 1857, 109; Mon. Hel. Viv. IV, 276.—W. G. Binney, Terr. Moll. IV, 16, pl. lxxix, f. 21.

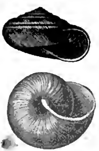
Aglaja mormonum, Tryon, Am. Journ. Conch. II, 314, pl. v, f. 14 (1867).

Mormon Island, California; San Joaquin Valley, north to Mt. Shasta (*Newcomb*[1]).

The specimens lately received from California, which appear to be referable to this species, are singularly granulated on the first one and a half apical whirls, and the epidermis of the next two or three whirls is sparingly ornamented with small but very distinct raised lines or points, something like prostrate hairs, being part of and same color as the epidermis.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
9345	4	Near Pitt River, Cal.	Dr. J. O. Cooper.	......

Fig. 300.



Helix sequoicola.

Helix sequoicola, J. G. Cooper.—Shell umbilicated, globosely-depressed, rather thick, of a light chestnut color, lighter below, with a band of darker color revolving above the middle of the body-whirl, between two equal bands of white; surface but slightly roughened by coarse, irregular wrinkles of growth, often decussated with coarse indented revolving lines, the upper whirls with prominent, crowded, minute, isolated granulations, running in ridges or series in an oblique direction to the wrinkles of growth; spire obtusely conic; whirls six, but slightly convex, the last more globose, slightly descending before; umbilicus moderate, conical; aperture very oblique, subcircular; peristome white, thickened, ends approaching, its columellar portion widened and reflected, partially covering the umbilicus. Greater diam. 27, lesser 21; height 12 mill.

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[1] Newcomb says (Pr. Cal. Ac. III, 119) that *H. cultellata*, Thompson, is identical with this species. It does not even belong to the same genus.

Helix sequoicola, J. G. Cooper, Proc. Cal. Acad. III, 259 (1866).
Aglaja sequoicola, Tryon, Am. Journ. Conch. III, 160, pl. xi, f. 27 (1867).

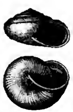
Santa Cruz Co., California.

In form and coloring much allied to *Helix mormonum*, but readily distinguished by its peculiar sculpturing. It may be hirsute when in a perfect condition.

The shell described and figured was received from Dr. Cooper.

Helix traskii, Newcomb.—Shell umbilicated, globosely-depressed, very thin, translucent, dark horn-colored, with a revolving chestnut band, doubly edged with white; with delicate oblique striæ and crowded microscopic revolving lines; spire hardly elevated, apex flattened; whirls six, slightly convex, gradually increasing, the last rather plane above, inflated below, not falling before, banded above the middle; umbilicus moderate, conical; aperture very oblique, lunately semicircular, banded within; peristome with a white thickening, regularly rounding, its terminations joined by a light transparent callus, that of the columella widened, subreflected, but not at all covering the umbilicus. Greater diam. 21, lesser 16; height 9 mill.

Fig. 301.



Helix traskii.

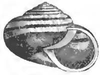
Helix traskii, Newcomb, Proc. Cal. Acad. Nat. Sci. II, 91 (1861).
Aglaja traskii, Tryon, Am. Journ. Conch. II, 314, pl. v, f. 16 (1866).

Los Angelos, California.

The specimen figured was received from Dr. Newcomb. It may not be entirely mature.

Helix dupetithouarsi, Deshayes.—Shell umbilicated, orbicularly-convex, smooth or substriate, dark chestnut, lighter above, with a dark red, white-margined band; spire obtusely conoid; whirls seven to eight, narrow, rather convex, the last inflated; aperture ovate semilunar, white, and banded within; peristome simple, narrowly reflected, its columellar end arched, dilated and arched above, not covering the moderate umbilicus. Greater diam. 29, lesser 25; height 17 mill.

Fig. 302.



Helix dupetithouarsi.

Helix dupetithouarsii, DESHAYES, Rev. Zool. 1839, 360; in GUERIN, Mag. 1841, tab. xxx; in FER. I, 169, pl. xcvii, f. 8–10.—PFEIFFER, Mon. Hel. Viv. I, 338, excl. var.; III, 229; in CHEMNITZ, ed. 2, I, 328, pl. lviii, f. 6–7 (not pl. lvi, f. 3–5).—REEVE, Con. Icon. 659.—GOULD, Terr. Moll. III, 14.—W. G. BINNEY, Terr. Moll. IV, 15, pl. lxxvi, f. 9; Pac. R. R. Rep. VI, 114 (1857).

Helix oregonensis, LEA, Trans. Am. Phil. Soc. VI, 100 (1839); Obs. II, 100, pl. xxviii, f. 9; TROSCHEL, Arch. f. Nat. 1839, II, 221.—DEKAY, N. Y. Moll. 46.—PFEIFFER, formerly, Mon. Hel. Viv. I, 428.

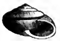
Aglaja dupetithouarsi, TRYON, Am. Journ. Conch. II, 315, pl. v, f. 17 (1866).

Puget Sound to San Diego.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8320	7	Klamath Lake, Oregon.	......	......
8321	1	Benicia.	......	......
8322	2	Talan Lake, Cal.	......	......
8323	1	San Diego, Cal.	Lieut. Ives.	......
3293	5	Monterey.	Lt. W. P. Trowbridge.	......
8324	2	Interior of California.	Com. Wilkes.	......
8325	4	Point Cypress, Monterey.	......	......
8326	1	Interior of California.	Com. Wilkes.	*nickliniana ?*
8327	1	Puget Sound.	......	= *oregonensis*, Lea.
8479	13	Monterey, Cal.	Lt. W. P. Trowbridge.	With animal in alcohol.
8549	4	Point Cypress, Monterey.	Dr. C. A. Canfield.	Cab. series.
8559	3	Monterey.	"	"

Helix ruficincta, NEWCOMB.—Shell depressed-globose, umbilicated, rather thin, smooth, surface scarcely broken by incremental striæ, with occasional revolving lines, horn-color, with a median, revolving dark brown band, margined with white; spire little elevated; whirls five to six, scarcely convex, the last flattened-globose, descending at the aperture, convex below; aperture banded within, oblique, roundly lunate; peristome white, thickened, its inner margin obtusely rounded, the right portion straight, basal and columellar portions reflected, partially concealing the umbilicus. Greater diam. 17, lesser 14; height 9 mill.

Fig. 303.



Helix ruficincta.

Helix rufocincta, NEWCOMB, Proc. Cal. Acad. Nat. Sci. III, 117 (1864).

Aglaja rufocincta, TRYON, Am. Journ. Conch. II, 315, pl. vi, f. 20 (1866).

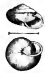
San Diego and Catalina Isl., California.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
9349	3	Catalina Island.	Dr. J. G. Cooper.	......

Helix gabbi, Newcomb.—Shell subperforate, depressed-globose, thin, smooth, very delicately striated, dirty white, darker above, with a median revolving, white-margined brown band; spire little elevated; whirls five, rather convex, the last flattened globose, descending at the aperture; aperture lunately rounded, oblique; peristome white, thickened, somewhat reflected, the columellar portion almost covering the umbilicus. Greater diam. 10, lesser 8; height 5 mill.

Helix gabbii, Newcomb, Proc. Cal. Acad. Nat. Sci. III, 117 (1864).
Aglaja gabbii, Tryon, Am. Journ. Conch. II, 315, pl. vi, f. 19 (1866); III, pl. xi, f. 31 (1867).

Fig. 304.

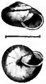


Helix gabbi.

San Clemente Island, California.

Under the name of *H. tenuistriata* (certainly not of Binney) I have received a shell from Catalina Island, apparently a less developed form of *H. gabbi.* It is here figured.

Fig. 305.

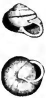


Helix tenuistriata.

Helix facta, Newcomb.—Shell imperforate or subperforate, globose or depressed-globose, smooth, shining, surface hardly broken by delicate incremental striæ and revolving lines, light fawn color above, below lighter, with a median, white-margined, revolving band of a darker colored hue; spire elevated, apex obtuse; whirls five to six, rather convex, the last slightly descending, globose; aperture oblique, banded within; peristome thickened, brownish, shining, its inner margin rounded, reflected, the columellar portion dilated, appressed, partially or entirely covering the umbilicus. Greater diam. 14, lesser 12; height 8 mill.

Helix facta, Newcomb, Proc. Cal. Acad. Nat. Sci. III, 118 (1864).
Agloja facta, Tryon, Am. Journ. Conch. III, 162, pl. xi, f. 32 (1867).

Fig. 306.



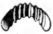
Helix facta.

Sta. Barbara Island, California. On this and San Nicolas Island is found a larger, heavier, extinct variety.

Jaw arcuate, of equal breadth throughout; anterior surface with distant, stout ribs, denticulating either margin.

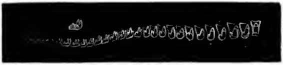
Lingual membrane with 114 rows of 29—1—29 teeth; centrals long, stout, obtuse, laterals long, acutely pointed with a short side-cusp, becoming modified and merging into wide irregularly-pointed uncini.

Fig. 307.



Jaw of *Helix facta.*

Fig. 308.

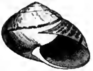


Lingual dentition of *Helix facta*.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
9346	4	Sta. Barbara Isl., Cal.	Dr J. G. Cooper.	......
9350	4	" "	"	......

Helix kelletti, Forbes.—Shell narrowly umbilicated, depressed-globose, thin, wrinkled, granulated, fulvous; spire subturbinated, with dirty reddish blotches and one red revolving band; whirls six, rather convex, the last with a white band at its periphery, and inflated on its under surface; aperture roundly lunate, light red and banded within; peristome somewhat reflected, its columellar portion dilated, reflected, covering the umbilicus. Greater diam. 22, lesser 19; height 19 mill. (*Forbes.*)

Fig. 309.



Helix kelletti.

Helix kelletti, Forbes, Proc. Zool. Soc. London, 1850, 55, pl. ix, f. 2, a, b.—Reeve, Con. Icon. no. 665 (1852).—Pfeiffer, Mon. Hel. Viv. III, 183; in Chemnitz, ed. 2, II, 467, pl. clvi, f. 19, 20 (1853).—W. G. Binney, Terr. Moll. IV, 17, pl. lxxxvi, f. 12.

Arionta kelletti, Tryon, Am. Journ. Conch. II, 317, pl. vi, f. 1 (1866).

San Diego. Catalina Island, San Nicolas Island, California.

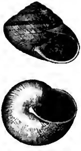
The specimen figured is from Catalina Island, California. I am not positive that it is correctly referred to *H. kelletti*. The umbilicus is entirely closed in mature specimens. There are traces on different parts of each shell of three different series of sculpturing; the wrinkles of growth, revolving impressed lines, and a series of minute granulations running obliquely, sometimes almost perpendicularly, to the incremental wrinkles.

Forbes' original figure of *H. kelletti* is copied in the fourth volume of the Terrestrial Mollusks.

Cat. No	No. of Sp.	Locality.	From whom received.	Remarks
3368	4	San Diego, Cal.	Lieut. Ives.	......
8352	2	" "	"	Cab. series

Helix stearnsiana, Gabb.—Shell narrowly umbilicated, subglobose, solid, of a dirty white color, irregularly mottled with crowded ashy blotches, grouped into revolving series below, with a decided wide, brownish revolving band above; with delicate oblique incremental striæ, unequally cut by revolving lines; spire elevated; whirls five, rather convex; aperture oblique, semicircular; peristome simple, acute, its columellar termination white, expanded, reflected over the half concealed umbilicus. Greater diam. 22, lesser 17; height 12 mill.

Fig. 310.



Helix stearnsiana.

Helix stearnsiana, Gabb, Am. Journ. Conch. III, 235, pl. xvi, f. 1 (1867).

Lower California, from Sta. Tomas to Rosario, under stumps of Maguey. (*Gabb.*)

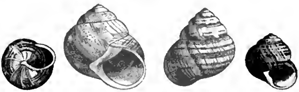
The shell figured and described was received from Dr. Newcomb. It may not be entirely mature.

Subgenus **EUPARYPHA**, Hartm.

Shell perforate, depressed-globose, corneo-calcareous, banded; whirls 5, the upper ones flattened, carinate, the last inflated; aperture dilate-lunar, often labiate within, its columellar margin reflexed.

Helix areolata, Sowerby.—Shell perforated, orbicularly conoid, striated, shining, white, variously ornamented with revolving interrupted reddish lines; spire depressed-conoid; whirls five, rather convex, the last scarcely descending, somewhat convex at base; aperture roundly lunar, smoky within; peristome acute, somewhat thickened within, its columellar portion shortly arched, dilated, reflected, with one tooth-like

Fig. 311.



Helix areolata and variety.

callosity (sometimes wanting), and almost covering the umbilicus. Greater diam. 26, lesser 23; height 18 mill.

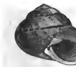
Helix areolata, Sowerby, Brit. Mus.—Pfeiffer in Zeitschr. f. Mal. 1845, II, 154; Mon. Hel. Viv. I, 152; in Chemnitz, ed. 2, I, 248, pl. xxxvi, f. 10–13.—Philippi, Icon. II, 15, p. 184, pl. ix, f. 4 (1847).—Gould, Terr. Moll. III, 15.—W. G. Binney, Terr. Moll. IV, 19, pl. lxxvi, f. 3, 11.—Reeve, Con. Icon. 664.
Polymita areolata, Tryon, Am. Journ. Conch. II, 319, pl. vi, f. 5 (1866).
Arionta veitchii, Tryon, Am. Journ. Conch. II, 316, pl. v, f. 19 (1866).

The specimens figured are from Cerros Island, California. The species is also quoted from Oregon, and is referred by Newcomb to Margarita Bay.

Cat. No.	No. of Sp	Locality.	From whom received.	Remarks.
8715	1	Cerros Island, Cal.	Dr. Veatch.	Cab. series.
8716	2	" "	"	"
8717	2	" "	"	"
8720	5	" "	"	......

Helix tryoni, Newcomb.—Shell imperforate, globose-conic, solid, with distant, deep, strong revolving lines cutting through the striæ of increase, of a bluish ash color above, mottled with irregular oblique patches of brown, and with a median revolving line of dark brown, below dirty white; spire conic; apex obtuse, smooth, shining, light horn-color; whirls five to six, scarcely convex, the last globose, descending towards the aperture, inflated below; aperture oblique, subcircular, small, within dark above, lighter below; peristome thickened, dirty white, its terminations somewhat converging, joined by a light callus, right margin slightly expanded, not reflected, that of the columella dilated, scarcely reflected, appressed, obtusely subdentate. Greater diam. 24, lesser 20; height 14 mill.

Fig. 312.



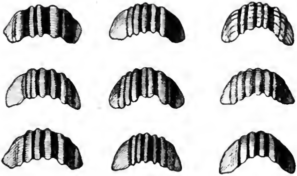
Helix tryoni.

Helix tryoni, Newcomb, Proc. Cal. Acad. Nat. Sci. III, 116 (1864).—W. G. Binney, Am. Journ. Conch. I, 47, pl. vi, f. 1–10 (1865).
Polymita tryoni, Tryon, Am. Journ. Conch. II, 319, pl. vi, f. 3 (1866).

San Clemente Island and San Nicholas Island, California.

Jaw arcuate, of uniform width throughout, ends blunt; anterior surface with stout ribs, denticulating either margin. Figures of the jaws of nine mature individuals are given, showing that the number and arrangement of the ribs is not constant; a fact noticed in other species.

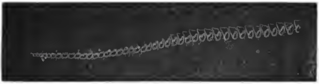
Fig. 313.



Jaws of Helix tryoni.

The lingual membrane has 190 rows of 43—1—43 teeth each; centrals and first nine laterals obtusely conical; last seven laterals and first five uncini of same shape, but with obtuse side cusp; balance of uncini serrated.

Fig. 314.

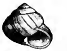


Lingual dentition of *Helix tryoni.*

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
9343	1	San Nicholas Isl., Cal.	Dr. J. G. Cooper.	Figured.
9344	5	Santa Barbara Isl., Cal.	"	......

Helix pandoræ, Forbes.—Shell imperforate, globose-conic, rather solid, reddish above, violet on the apex, ashy below, bound with numerous, interrupted, light blotches and lines; whirls five, rounded; suture impressed; aperture subcircular; peristome narrowly reflected, white, its ends approaching; throat bluish; columella thickened, rounded. Greater diam. 17, lesser 16; height 14 mill.

Fig. 315.



Helix pandoræ.

Helix pandoræ, FORBES, Proc. Zool. Soc. 1850, 55, pl. ix, f. 3, a, b.—REEVE, Con. Icon. 671.—PFEIFFER, Mon. Hel. Viv. III, 127; in CHEMNITZ, ed. 2, III, 467, pl. clvi, f. 17, 18 (1853).—GOULD, Terr. Moll. III, 15.—W. G. BINNEY, Terr. Moll. IV, 18, pl. lxxvi, f. 8.

Helix damascenus, GOULD, Proc. Bost. Soc. Nat. Hist. Oct. 1856, VI, 11.

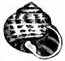
Polymita pandoræ, TRYON, Am. Journ. Conch. II, 320, pl. vi, f. 8 (1866).

Margarita Bay, Lower California.

The specimen figured wants the characteristic revolving lines and blotches.

Helix levis, PFEIFFER.—Shell perforate, globose, thin, smooth, obliquely striate, obsoletely granulated, white, varied with regular series of spots or bands of horn-color; spire short, rather acute; whirls five, scarcely convex, the last inflated; aperture roundly lunar, within somewhat yellow; peristome acute, somewhat thickened within, its columellar portion dilated above, arched and reflected, almost covering the perforation. Greater diam. 16, lesser 14; height 13 mill.

Fig. 316.



Helix levis, var.

Var. *β*. The columellar portion of the peristome with a single obtuse, tooth-like callosity.

Helix levis, PFEIFFER, Mon. Hel. Viv. I, 154; III, 128; Zeitschr. f. Mal. 1845, 152; in CHEMNITZ, ed. 2, I, 249, pl. xxxvi, f. 16, 17 (1846).—REEVE, Con. Icon. 1214.—W. G. BINNEY, Terr. Moll. IV, 18. pl. lxxvi, f. 10.

Polymita levis, TRYON, Am. Journ. Conch. II, 320, pl. v, f. 21? (1866).

Columbia River.

Dr. Newcomb doubts its being a Californian or Oregon species.

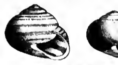
SUBGENUS TACHEA, Leach.

Shell imperforate, globose or subdepressed, white or yellow, ornamented with distinct bands; whirls 5, the last convex, tumid, descending at the aperture; aperture broadly lunate, obsoletely angular; peristome thickened, reflexed, its columellar margin constricted, callous.

Animal (of *H. hortensis*): head and neck blackish, with a slight tinge of brown; eye-peduncles smoky; eyes black; base of foot inky, posterior extremity dirty flesh-color; foot rather slender, terminating acutely; respiratory foramen surrounded with a blackish circle; length about twice the breadth of the shell.

Helix hortensis, Müller.—Shell imperforate, subglobose; epidermis shining, smooth, olivaceous-yellow, and often variously ornamented with rufous horizontal bands or lines; whirls five, convex; spire somewhat elevated; suture, at the extremity of the last whirl, curved towards the aperture; peristome slightly reflected, white, obsolete on the base, with the margin thickened internally; aperture rounded, slightly contracted at the base by the thickening and indentation of the peristome; umbilicus covered, indented; base convex. Greater diam. 20, lesser 17; height 12 mill.

Fig. 317.



Helix hortensis.

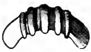
Helix hortensis, Müller, &c.—Pfeiffer, Mon. Hel. Viv. III, 195.—Mrs. Sheppard, Tr. Lit. Hist. Soc. Quebec, I, 193 (1829).—Gould, Invert. 172.—Binney, Terr. Moll. II, 111, pl. viii.—W. G. Binney, Terr. Moll. IV, 51.—Morse, Amer. Nat. I, 186, f. 16 (1867).

Helix subglobosa, Binney (formerly), Bost. Journ. Nat. Hist. I, 485, pl. xvi (1837).—DeKay, N. Y. Moll. 33, pl. ii, f. 14; pl. iii, f. 39.

Tachea hortensis, Morse, Journ. Portl. Soc. I, 10, f. 11, pl. iv, f. 12 (1864).—Tryon, Am. Journ. Conch. II, 321, pl. vi, f. 14, 15 (1866).

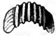
An European species, introduced by commerce (?) to the north-eastern portion of North America. It is found on islands along the coast from Newfoundland to Cape Cod, and on the main-land plentifully in Gaspé, C. E.; also along the St. Lawrence; Vermont (?), Connecticut (?), &c. It also inhabits Greenland.

Fig. 318.



Jaw of *Helix hortensis*. [Morse.]

Fig. 319.

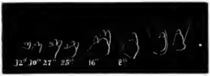


Jaw of *Helix hortensis*. [Moquin-Tandon.]

Jaw arcuate, of uniform width throughout; ends blunt; centre of anterior surface with a few stout, distant ribs, denticulating both margins. Compare the fac-simile of Moquin-Tandon's figure of the jaw of a French specimen.

Lingual membrane with 116 rows of 32—1—32 teeth each; centrals long, obtusely conical; first laterals of same shape, gradually becoming modified into uncini with irregular and obtusely rounded denticles.

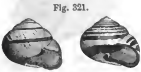
Fig. 320.



Lingual dentition of *Helix hortensis*. [MORSE.]

The *Helix nemoralis* of Europe, distinguished readily from *H. hortensis* by its black peristome, but by many considered identical, does not appear to have been introduced from Europe into the New England States or British Provinces. In 1857 I imported some hundred living specimens from near Sheffield, England, and freed them in my garden, in Burlington, New Jersey. They have thriven well and increased with great rapidity, so that now (1865) the whole town is full of them. They retain the habit of the species of climbing hedges and trees, not remaining concealed under decaying leaves, logs, &c., like the American *Helices*. Fig. 321 is drawn from Burlington specimens. The experiment of introducing the *Helix nemoralis* is interesting, as showing the adaptability of the species to a new climate. Other species, among them *H. lapicida* from England, and *Stenogyra decollata* from Charleston, S. C., placed in my garden at the same time, disappeared at once.

Fig. 321.



Helix nemoralis.

The jaw of a Burlington specimen is very strongly arched, with four stout ribs on its anterior surface, denticulating each margin.

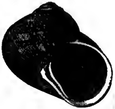
Cat. No	No of Sp.	Locality.	From whom received.	Remarks.
8022	4	Massachusetts.	W. Stimpson.	(*H. subglobosa*.)
8023	2	Ils. in Casco Bay, Me.	......	"
8024	1	Halifax, N. S.	Willis.	"
8618	4	House Is., Manchester, [Mass.	W. O. Binney.	Cab. series.
8619	3	Mass., Ils	W. Stimpson.	"
8704	6	" "	"	......
9162	1	Ludlowville, Cayuga L.	Mrs. H. W. Parker.	......

SUBGENUS **POMATIA**, (Leach) Beck.

Shell imperforate or subimperforate, globose, striate, horny-calcareous, generally banded; whirls 4–6, convex, the last large, ventricose, descending; aperture lunate-orbicular, peristome patulous or straight, within labiate with callus, the columellar margin reflected, generally callous.

Helix aspersa, Müller.—Shell imperforate, subglobose, rather thin, the surface rather coarsely and irregularly striate, and finely wrinkled and indented; the ground-color is yellowish or grayish, with chestnut-colored bands of various width, across which are narrow undulating flammules of yellowish; the spire is rather obtuse, composed of four or five moderately convex whirls, the principal one being very large and ventricose; the aperture is large, a little oblique, rounded lunate; the peristome white, sharp, turned slightly outward, and in the region of the umbilicus turning over the columella in a broad appressed callus, which is continued to the upper junction of the peristome. Greatest diam. 32, height 22 milli.

Fig. 322.

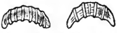


Helix aspersa.

Helix aspersa, Muller, Verm. II, 59.—Pfeiffer, Mon. Hel. Viv. I, 241.—DeKay, N. Y. Moll. 47 (1843).—Binney, Terr. Moll. II, 117, not in plate.—W. G. Binney, Terr. Moll. IV, 51, pl. lxxvii, f. 4.
Pomatia aspersa, Tryon, Am. Journ. Conch. II, 322, pl. vi, f. 16 (1866).

In gardens in Charleston, S. C., where it still exists. Also has been found at New Orleans; Portland, Maine; Nova Scotia; Santa Barbara, California. It is an European species, accidentally introduced into this country.

Fig. 323.



Jaw of *Helix aspersa*, young and mature. [Moquin-Tandon.]

Moquin-Tandon describes the jaw of *H. aspersa* as slightly arcuate, somewhat attenuated towards the blunt ends; anterior surface with stout, distant ribs, denticulating either margin.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
7945	1	Charleston, S. C.	Lieut. Kurtz.	......
8307	2	" "	W. G. Binney.	Cab. series.

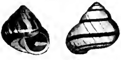
Subgenus **POLYMITA**, Beck.

Shell with the perforation open or closed, globose, shining; spire short; whirls 4–5, the last large, deflexed at the aperture; columella dilated at the base; aperture contracted, subvertical, roundly lunate; peristome simple, obtuse, labiate within, its margins distant.

Animal (of *H. varians*, see Terr. Moll. IV, pl. lxxviii, f. 22) stout, anteriorly blunt, with long eye-peduncles; posteriorly long, acutely terminating.

Helix varians, Menke.—Shell subimperforate, of medium size, solid, conic-globose, delicately striate, but leaving the surface smooth and shining; the ground-color is variable, being white, dusky, greenish or reddish, and either plain or variously encircled by dark bands; the apex and the peristome, especially the columellar portion, is always rose red, and generally, likewise, the throat; the spire is elevated, composed of about five and a half convex whirls, the outermost broadly rounded at the periphery; the base is moderately convex and perforated by a minute umbilicus, nearly covered by the expanded and flattened peristome; aperture small, approaching two-thirds of a circle; peristome acute, thickened within, a little everted, becoming more so towards its inner junction. Greater diam. 19, lesser 17; axis 15 mill.

Fig. 324.



Helix varians.

Helix varians, Menke, teste Pfeiffer.—Pfeiffer, Mon. Hel. Viv. I, 238; in Chemnitz, ed. 2, II, 221, pl. cix, f. 1–5.—W. G. Binney, Terr. Moll. IV, 51, pl. lxxviii, f. 22.

Helix carnicolor, Pfeiffer, Symb. I, 37.—Deshayes in Fer. I, 205, pl. xxix, A, f. 14–17.—Reeve, Con. Icon. no. 283 (1852).

Helix pisana, Pfeiffer in Chemnitz, IX, P. 2, 139, t. cxxxii, f. 1186, 87.—Ferussac, Hist. *l.* c.?—Not of Muller.

Helix submeris, Mighels, Bost. Proc. I, 187 (1844).—Pfeiffer, Mon. Hel. Viv. III, 183.

Helix rhodocheila, Binney (formerly), Terr. Moll. I.

Hemotrichus hæmastomus, Swainson, Malac. 165, f. 19.?

Helix polychroa, Binney, Terr. Moll. II, 123, pl. xlvi; xlvii.
Polymita varians, Tryon, Am. Journ. Conch. II, 321, pl. vi, f. 9-13 (1866).

Key West, Key Biscayne, Cape Florida. Also at New Providence.

Fig. 325.

Jaw of *Helix varians*.

Jaw[1] strongly arched; ends attenuated, pointed; anterior surface smooth; concave margin simple, with an obtuse, median projection.

Lingual dentition as in *Helix alternata, monodon, sayii*, &c.

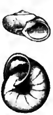
Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
7930	6	Key Biscayne, Fla.	G. Wurdemann.	......
7931	3	Florida Keys.	......	......
8893	4	Key Biscayne, Fla.	G. Wurdemann.	Cab. series.

Subgenus **AMPELITA**, Beck.

Shell broadly umbilicated, depressed, orbicular; whirls 4–5, the last more or less angulated or carinated, falling before, convex at base, angularly passing into a spreading umbilicus; aperture lunately-elliptic or irregularly rhomboid; peristome reflected, its terminations approaching, usually joined by callus.

Helix rowelli, Newcomb.—Shell broadly umbilicated, orbicular, depressed, opaque white, with a revolving chestnut band, polished, very finely obliquely striate, hirsute? or granulated; whirls 4½, convex, the last large, flattened, anteriorly descending; spire but little elevated, at the apex projecting like a nipple; suture moderately marked; aperture very oblique, truly circular; peristome thin, slightly reflected, margins approximated, continued by callus adhering to the parietal wall of the aperture. Greater diam. 20, lesser 15; height 7 mill.

Fig. 326.



Helix rowelli.

Helix rowelli, Newcomb, Proc. Cal. Acad. Nat. Sci. III, 181 (1865).
Aglaja rowellii, Tryon, Am. Journ. Conch. II, 316, pl. xi, f. 30 (1867).
Helix löhrii, Gabb, Am. Journ. Conch. III, 236, pl. xvi, f. 2 (1867).

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[1] The same style of jaw exists in *Helix microphysa, albersiana*, and *disculus*, but not in *Helix muscarum*.

Helix lohrii, was found by Mr. Gabb on the table-lands near Malejo, Lower California. Specimens received from him agree with the type of *H. rowelli* lent me for figuring by Dr. Newcomb (Fig. 326).

The shell is much like a gigantic *H. pulchella*.

DOUBTFUL, SPURIOUS, EXTRALIMITAL SPECIES OF HELIX.

Helix —— (SHEPPARD, Trans. Lit. and Hist. Soc. Quebec. I, 194).—Shell thin, conoidal, perforated; spire very flat; margin of lip reflected.

Common in the same place as the above (*H. hortensis*, Plains of Abraham, Quebec); it is a much less shell, with a brown epidermis; the penultimate whirl has an elevated white ridge near the aperture, which appears to be some remains of the last year's lip. (*Sheppard.*) [= *H. rufescens?*]

Helix sagraiana, D'ORBIGNY, a Cuban species, is erroneously attributed to California (on the authority of SOWERBY) by PFEIFFER (Mon. I, 325) and CARPENTER (Report, p. 214).

Helix sandiegoensis, LEA, is mentioned by name only by GOULD, Pac. R. R. Rep. V, 331.

Helix attenuata, Lake Superior, &c., is given without description by J. DE C. SOWERBY, in RICHARDSON'S Fauna Boreali-Americana (III, 315) together with

Helix gularis,

Helix rudis, and

Helix paludosus (= *H. minuta*).

Helix angulata, SHEPPARD, is quoted as synonym of *Planorbis campanulatus*, by J. DE C. SOWERBY, in Fauna Boreali-Americana, III, 315.

Helix pallida, BONOIN, Virginia, is quoted as a synonym of an unnamed *Helicella* by G. B. SOWERBY (Tankerville Coll. 37), and

Helix corrugata, BUDGIN, is quoted by the same (p. 42) as a synonym of *Limnæa corrugata*, and

Helix viridata, BUDGIN, Virginia, is quoted by the same (p. 43) as synonym of *Paludina viridis*, and

Helix imperfecta, BUDGIN, is quoted by the same (p. ix of Appendix) as synonym of *Melania inermis*.

Helix minuta, TAUA (Proc. Essex Inst. II, pt. 2, p. 193, Salem, Mass. 1860).—Shell minute, rounded conical, smooth, apex obtuse; epidermis of a uniform reddish horn-color; whirls four, rounded above and below, with a well-defined suture; aperture rounded, lip simple and thin, umbilicus broad and deep. Diameter about one-twentieth inch.

Helix peregrina (Bosc, Hist. Nat. des Coq. IV, 57, 1830).—Ovale, imperforée; les tours de spire écartés, décroissants également, l'ouverture ovale.

Schwet, Einl. in Conch. II, tab. iv, f. 11. Se trouve dans les iles de la côte ouest de l'Amérique. (*Bosc.*)

Helix radiata, Lister (Europe and Virginia), of Bosc, Hist. IV, 32, appears to be *H. alternata*, as reference is given to Lister's figure of that species.

Helix trivolvis, Eaton (Zool. Text-Book, p. 194) = *Planorbis*.

Helix bicarinatus (*id.* 194) = *Planorbis*.

Helix parvus (*id.* 195) = *Planorbis*.

Helix catascopius (*id.* 195) = *Limnæa*.

Helix heterostrophus (*id.* 195) = *Physa*.

Helix subcarinatus (*id.* 195) = *Lioplax*.

Helix virginica (*id.* 195) = *Melania*.

Helix vivipara (*id.* 196) = *Vivipara contectoides*.

Helix decisa (*id.* 196) = *Melantho*.

Helix cumberlandicus, Lea, of Wheatley's Cat. U. S. p. 18, is the same, I presume, as *H. cumberlandiana*.

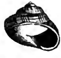
Helix immitissima, Lea, of the same, p. 19 = *H. minutissima?*

Helix pallida, Say, of same = *H. palliata.?*

Helix depicta (Grateloup, Soc. Lin. Bordeaux, XI, 399, pl. 1, f. 12, 1839).—Shell subglobose, conic, imperforate, thin, white, very delicately striate, ornamented with varied lines and interrupted bands; lip simple, acute.

This pretty shell has some points of resemblance with *Helix pisana*, Müll., but is smaller and not umbilicated. The internal edge of the right lip is white instead of rose. The upper surface is covered with numerous yellowish-brown bands, more or less deep, interrupted by oblique lines of same color. Five whirls. Height 11, diam. 15 mill.

Fig. 327.



Helix depicta.

Island of St. Thomas; New Orleans.

Helix pisana, Müller, United States.—Ferussac, Tabl. Syst. 119.—Gray, Turton's Manual.—Forbes, Brit. Ass. Rep. 1840, 145.—See Bost. Journ. III, 489. This species is not known to exist in America at the present day (1864).

Helix trumbulli, Linsley, Shells of Conn. (Sill. Journ. [1], XLVIII, 280), = *Skenea serpuloides*. See Terr. Moll. IV, 125.

Helix pellucida, Fabricius = *Vitrina angelicæ*.

Helix arbustorum. See Terr. Moll. IV, 124, and Adams, Cat. Cabinet, 32. Does not inhabit America.

Helix hieroglyphica, Beck, Ind. Am. Sept.? See Terr. Moll. IV, 124.

Helix domestica, Ström. See *Vitrina angelicæ*.

Helix dealbata, Say = *Bulimulus*.

Helix corpuloides. See Terr. Moll. IV, 124.

Helix bonplandi, Lamarck. See Terr. Moll. IV, 124. Jay, Cat. ed. 2, 33. Tennessee.

Helix haliotoides, Fabricius, Fauna Gröenl. 390 (1780) = *Sigaretus*.

Helix virginea, Wood, Ind. Suppl. p. 21, f. 19 = *Melania virginica*.
Helix nrceus, Müller, Dillwyn, Cat. 11, 918 = *Ampullaria*.
Helix fuscata, Born, Mus. Virid. 1780, 390, pl. xvi, f. 17. Virginia.
Helix irrorata, Say = *H. lactea*, Muller. See Terr. Moll. IV, 124. Does not now exist in America.
Helix rastellum, Beck, Ind. 8. Am. s.
Helix personata, Lamarck, Ohio. Jay, Cat. ed. 2, 36, 1836, and Villa, Disp. 14, 1841.
Helix punctata, Dillwyn, Cat. II, 899, is from Martinique, not Virginia.
Helix ruderata, Studer, Anthony, Ohio Cat. no. 31 = *striatella ?*
Helix variabilis, Drap., North America. See Forbes, Brit. Ass. Rep. 1840, 145; see also Bost. Journ. Nat. Hist. III, 489; Ferussac, Tabl. Syst. 48.
Helix (*Eurycratera*) *lineolata*, Lam., is erroneously quoted from North America by Beck (Index, 45).
Helix steenstrupii, Mörch. Greenland. I can find no description of it. *Vide* Terr. Moll. IV, 117.
Helix subcarinata, Wood (Index, Suppl. pl. vii, f. 13) = *Leptoxis*.
Helix dissimilis, Wood (Index, Suppl. pl. vii, f. 18) = *Melantho decisa*.
Helix decisa, Wood (Index, Suppl. pl. vii, f. 19) = *Lioplax subcarinata*.
Helix bidentifera, Phillips (Proc. Acad. Nat. Sci. Philad. I, 27, 1841), North Carolina = *H. barbula*, Charp., of Portugal (*l. c.* p. 133).
Helix palustris, Rackett. See *Limnæa palnstris*.
Helix angulata, Rackett. See *Planorbis bicarinatus*.
Helix albella, Dillwyn, Cat. II, 890. Virginia.

Fossil Species of Helix.

Dr. Meek furnishes the following list of fossil species:—

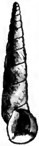
Helix leidyi, Hall & Meek, Am. Ac. Arts and Sci. Boston, V, 394, new ser.
Helix amplexus, Meek & Hayden, Proc. Acad. Nat. Sci. Philad. 1861, 431 = *Planorbis amplexus*, M. & H. Proc. Acad. Nat. Sci. Philad. 1857, 135.
Helix spatiosa, M. & H. (*Macrocyclis*), " " " 1861, 446.
Helix vitrina, " " " " " 1861, 447.
Helix nebrascencis, " " " " " 1861, 431 = *H. occidentalis*, M. & H. *l. c.* 1857, 135 (non Recluz, 1845).
Helix vetusta (nom. trans. ob. *H. v.* Mor. & De. 1857, J. C. (2), II, 153), M. & H. Proc. Acad. Nat. Sci. Philad. 1860, 431 = *H. vitrinoides*, M. & H. *l. c.* 1857, 135 (non Deshayes, 1830).
Helix evansi, M. & H. *l. c.* 1860, 175.
Helix obliqua, M. & H. *l. c.* 1857, 134.

EUCALODIUM ? Crosse & Fischer.

[The generic position of the following species is uncertain. See Bland, Ann. N. Y. Lyc. IX.]

Cylindrella taylori, Pfeiffer.—Shell not rimate, cylindrically subulate, integral, thin, paper-like, with stout, coarse, longitudinal wrinkles, becoming gradually delicate towards the apex, which is smooth, color dead white; spire much attenuated, apex obtuse; suture impressed; whirls nine, the upper ones rather convex, the two lower ones flattened, the last obtusely carinated below, slightly twisted, and produced beyond the body of the shell, in front rapidly descending, acutely carinated, disjoined, produced; aperture semicircular, very oblique; peristome continuously free, acute, thin, the columellar portion effuse. Length 45, diameter 8; aperture 10 long, 8½ mill wide.

Fig. 328.



Cylindrella newcombiana.

Clausilia (Balea) taylori, Pfeiffer, Proc. Zool. Soc. 1861, 27, pl. ii, f. 7.
Cylindrella newcombiana, Gabb, Am. Journ. Conch. III, 237, pl. xvi, f. 3 (1867).
Eucalodium newcombianum, Bland, Ann. N. Y. Lyc. IX.

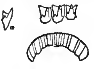
Central range of mountains, Lower California.

The shell figured was received from Dr. Newcomb. Its generic position is somewhat doubtful.

Jaw arcuate, with a slight median projection, longitudinally costate, the costæ 9–13, flattened, their terminations scarcely produced at the anterior or cutting margin, parallel with which are a few fine striæ.

Lingual membrane with 126 rows of 32—1—32 teeth, centrals with one long median cusp, and two short, blunt side-cusps, laterals the same, without the inner side-cusp.

Fig. 329.



Jaw and teeth of *Cylindrella newcombiana.*

COLUMNA, Perry.

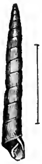
Shell sinistral or dextral, subulately turreted, decussately granulated; apex obtuse, whirls constricted at the suture, the lower impressed in the middle; aperture elongated, auriform, narrowed posteriorly; columella callous, loosely spirally twisted, forming an open canal along the length of the spire, the base abruptly truncate; peristome simple, straight, acute.

SUBGENUS **RHODEA**, H. & A. Ad.

Shell thin, dextral, clausiliaform; last whirl flattened, the base acutely carinated, excavated beneath; columella arcuated, thickened, subtruncate.

Columna californica, PFEIFFER.—Shell subulate, thin, with very crowded, oblique striæ or wrinkles, waxen white; whirls twelve to thirteen, the upper convex, the last three or four flat, the last exceeding slightly one-sixth the shell's length, sharply carinated at base, below the carina somewhat hollowed out; columella arched, thickened, subtruncated, reaching the base; aperture somewhat four-sided; peristome simple, acute. Length 23, diam. 3½ mill.; aperture 4 mill. long, 2¼ wide.

Fig. 330.



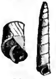
Columna californica.

Achatina californica, PFEIFFER, Symb. ad. Hist. Hel. III, 89; Mon. Hel. Viv. II, 267.—REEVE, Con. Icon. 115.—W. G. BINNEY, Terr. Moll. IV, 26, pl. lxxix, f. 19.—BLAND, Ann. N. Y. Lyc. VIII, 166, f. 10 (1865).
Columna californica, CHENU, Man. de Conch. I, 431, f. 3172.

Monterey, California. I have given a copy of Reeve's figure.

I doubt this shell really having been found in California. Fig. 331 represents a specimen from Bogota, New Granada, which seems identical with it. Mr. Bland (*l. c.*) positively asserts that the species should be removed from the American catalogue.

Fig. 331.



Columna californica.

FOSSIL SPECIES OF COLUMNA.

Columna? teres, MEEK & HAYDEN, Proc. Acad. Nat. Sci. Philad. 1860, 431 (= *Bul.? teres*), *Clausilia?* M. & H. *l. c.* 1856, 117.
Columna? vermiculus (*Clausilia?*), MEEK & HAYDEN, Proc. Acad. Nat. Sci. Philad. 1860, 431 (= *Bul.? vermiculus*), M. & H. *l. c.* 1856, 118.

BULIMUS, SCOPOLI.

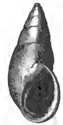
Shell oblong; aperture longitudinal, margin unequal, peristome thickened, generally expanded, columella pliciform.

Jaw arcuate, roughened by stout ribs, its concave margin crenated.

Bulimus spirifer, Gabb.—Shell rimately perforated, subfusiformly-oblong, thin, with delicate striæ of increase, in some places cut by fine revolving lines, pellucid, of a dead white color, or horn-color; spire turreted conic, apex acute; whirls six, convex, the last equalling two-thirds of the shell's length; aperture truncate-ovate; peristome white, shining, broadly expanded, reflected, acute, columellar portion very broad, widely reflected over the rimation, bearing far within upon its centre an upright, stout, twisted fold, ends approaching, connected by a shining white callus. Length 31, diam. 11; aperture 15 long, 11 mill. wide.

Bulimus spirifer, Gabb, Am. Journ. Conch. III, 236, pl. xvi, f. 5 (1867).

Fig. 332.



Bulimus spirifer.

From San Antonio to San Borja, Lower California. Very common (*Gabb*).

The description and figure are drawn from an authentic specimen.

Jaw like that of *Orthalicus*,[1] in about nineteen separate plates, whose overlapping seems to produce narrow longitudinal costæ.

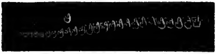
BULIMULUS, Leach.

Shell oblong, aperture longitudinal, edentulate, peristome thin, margins unequal; columella integral.

Jaw arcuate, with stout anterior ribs.[2]

Lingual membrane (of *B. dealbatus*) broad, central teeth tricuspid, the median cusp very long; laterals bicuspid.

Fig. 333.



Lingual membrane of *Bulimulus dealbatus.*

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[1] This does not agree with the generic description.

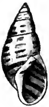
[2] Martens and Albers say "composite;" but I have not found it so with all those I have examined.

SUBGENUS DRYMÆUS, Albers.

Shell perforate or rimate, conic-elongated, thin, diaphanous, striatulate, variegated; whirls 6–8, rather convex; aperture ample, oblong-oval, equalling about half the shell's length, columella more or less tortuous, peristome thin, expanded, generally colored, its columellar margin reflected.

Bulimulus serperastrus, SAY.—Shell elongate, ovate, even fusiform, thin, with delicate lines of increment, yellowish-white, with about six unequal, interrupted, sometimes coalescent, bluish-black bands on the large whirl, three of which are continued on the upper whirls; whirls six or seven, slightly convex, with a fine, well-marked sutura; apertura less than half the length of the shell, innata, one-half longer than wide, rather acute at base; peristome sharp, expanded, its columellar portion widening upwards, and protecting a moderate-sized umbilical opening; columellar margin straight; the bands of the exterior reappear, in still deeper colors, in the fauces, but terminate at some distance short of the peristome, which is white, or tinted more or less rose-color. Length 31, diam. 13; aperture 15 long, 8 mill. wide.

Fig. 334.



Bulimulus serperastrus.

Bulimus serperastrus, SAY, New Harmony Diss. Dec. 30, 1830; BINNEY'S ed. 39.—PFEIFFER, Mon. Hel. Viv. II, 102; III, 341; in CHEMNITZ, ed. 2, 82, pl. xxx, f. 122; pl. xxxix, f. 5 (1854).—PHILIPPI, Icon. III, 23, p. 43, tab. ix, f. 6 (1850).—REEVE, Con. Icon. no. 252.—BINNEY, Terr. Moll. II, 274, pl. 1, f. 2.—W. G. BINNEY, Terr. Moll. IV, 126.

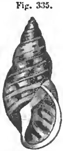
Bulimus liebmanni, PFEIFFER, Mon. Hel. Viv. II, 106.

Bulimus ziebmanni, REEVE, Con. Icon. 506.

Bulimus nitelinus, REEVE, Con. Icon. 398.

Drymæus serperastrus, TRYON, Am. Journ. Conch. III, 167, pl. xiii, f. 14 (1867).

Fig. 335.



Bulimus serperastrus. [SAY.]

Inhabits Central America and Mexico. Has been found in Texas.

This species belongs more to the fauna of Mexico than to that of the United States, but is admitted here because it has actually been found in Texas.

More slender and elongated individuals have been described under the names of *B. liebmanni* and *ziebmanni*. The former name is withdrawn

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in the third volume of Pfeiffer's Monograph. An imperfect, smaller specimen is described as *nitelinus*. I do not agree with Dr. Gould in also placing *B. lilacinus*, Rve., in the synonymy.

The specimen figured above is from Dr. Binney's collection. Fig. 335 is copied from a drawing by Mrs. Say under which is written, in Mr. Say's handwriting, "*Bulimus serperastrus*, Mexico, *Mr. McClure.*"

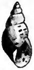
In the collection of Mr. Bland is an uniformly white specimen.

Subgenus **LIOSTRACUS**, Albers.

Shell thin, perforate, oblong-conic, glabrous, most often shining, banded; whirls 7–8, aperture obliquely semioval, much smaller than one-half the shell's length; peristome thin, more or less expanded, white, its columellar margin dilated-reflexed.

Bulimulus ziegleri, Pfeiffer.—Shell subperforate, ovate-conic, thin, decussated with crowded striæ and microscopic revolving nearly obsolete lines, white, sometimes varied with interrupted bands or blotches of chestnut; spire conical, rather acute; whirls six, scarcely convex, the last subangulated at its middle, a little shorter than the spire; columella slightly receding; aperture oval; peristome simple, its columellar portion slightly reflected, subappressed. Length 21, diam. 10; of the aperture 10 long, 6 mill. broad.

Fig. 336.



Bulimulus ziegleri.

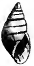
Bulimus ziegleri, Pfeiffer, Proc. Zool. Soc. 1845, 113; Mon. Hel. Viv. II, 175; III, 413; IV, 172.—Reeve, Con. Icon. 389.
Orthalicus ziegleri, Carpenter, Maz. Cat. 177.
Liostracus ziegleri, Tryon, Am. Journ. Conch. III, 168, pl. xiii, f. 6 (1867).

Mazatlan and Central America. It has not yet been found in eastern North America, and belongs more properly to the Mexican than North American fauna.

Fig. 336 is drawn from a specimen received from Dr. Pfeiffer.

Bulimulus marielinus, Poey.—Shell imperforate, ovate-conic, thin, very minutely substriate, somewhat shining, pellucid, white, varied above the middle by numerous subinterrupted, reddish-chestnut bands; spire conic, somewhat acute; whirls five, scarcely convex, the last about equalling the spire, subattenuated at base; aperture scarcely oblique, subelliptical, narrowed at base; peristome simple, straight, its columellar termination subreflected above, appressed. Length 16, diam. 8 mill.; of aperture, length 9, breadth in its centre 5.

Fig. 337.



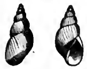
Bulimulus marielinus.

Bulimus marielinus, POEY, Memorias, I, 212, 447; II, pl. xii, f. 32, 33 (young).—PFEIFFER, Mon. Hel. Viv. III, 407.

Bulimus (*Leptomerus*) *marielinus*, TRYON, Am. Journ. Conch. III, 174, pl. xiv, f. 23 (1867).

A Cuban species, specimens of which were found by Dr. J. G. Cooper in southern Florida; one of them is drawn in Fig. 337.

Fig. 338.



Bulimulus floridanus.

Bulimulus floridanus, PFEIFFER.—Shell narrowly perforated, ovate-elongate, rather smooth, grayish-green, variegated with white opaque streaks and spots; spire elongate-conic, somewhat acute; whirls six and a half, rather convex, the upper ones banded with interrupted brown, the last about three-sevenths the length of the shell, subangulated below the middle, attenuated at the base; columella somewhat twisted, receding; aperture slightly oblique, oval; peristome thin, its right termination narrowly expanded, the columellar termination dilated, reflected, hardly touching the shell. Length 15⅔–17, diam. 7½; length of aperture 7½, diam. 4½ mill.

Bulimus floridanus, PFEIFFER, Proc. Zool. Soc. 1856, 330; Mon. Hel. Viv. IV, 406.—W. G. BINNEY, Terr. Moll. IV, 134, pl. lxxix, f. 3, not of CONRAD.

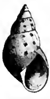
Liostracus floridanus, TRYON, Am. Journ. Conch. III, 168, pl. xiii, f. 7 (1867).

Florida.

The specific name must not be confounded with that proposed by Conrad for a fossil species (Sill. Am. Jour. [2], II, 399).

I have not seen this species. Fig. 338 is copied from drawings of the original specimen in Mr. Cuming's collection.

Fig. 339.



Bulimulus dormani.

Bulimulus dormani, W. G. BINN.—Shell perforated, rather heavy, shining, elongated-conic, white, with several regular revolving series of interrupted, perpendicular, reddish-brown patches; suture distinctly marked; apex punctured; whirls six, rather convex, marked with numerous very fine revolving lines; upper whirls striate, last whirl full, with a hardly perceptible obtuse carina at the upper extremity of the peristome. Length 29, diam. 12 mill.

Bulimus dormani, W. G. BINNEY, Proc. Acad. Nat. Sci. Philad. 1857, 188; Terr. Moll. IV, 132, pl. lxxx, f. 10.—PFEIFFER, Mal. Blat. 1859, 45.

Liostracus dormani, TRYON, Am. Journ. Conch. III, 169, pl. xiii, f. 8 (1867).

Found at several points near St. Augustine, Florida, by Major O. M. Dorman.

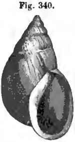
Judging from the description and figure given by Reeve, *Bulimus maculatus*, Lea, of Carthagena, New Grenada, must be nearly related to this species.

SUBGENUS **MESEMBRINUS**, Albers.

Shell rimate-perforate, conic-ovate, striated, white, variegated with red; rather solid; whirls 6–7; aperture shorter than the spire; columella subtortnous; aperture less than one-half the length, oblong ovate; peristome simple, acute, straight, its columellar termination more or less dilated, appressed, reflected.

Bulimulus pallidior, SOWERBY.—Shell rather solid, elongate ovate, white, faintly striate; spire acuminate; whirls six, convex; suture well impressed, last whirl three-fourths the length of the shell, tumid and somewhat gibbous on the back; aperture placed somewhat laterally, half the length of the shell, suboval, its plane nearly that of the axis, extremities of the peristome approximate; peristome moderately reflected at base, still less so laterally, rising broadly at the columella, and standing off from the body-whirl; umbilical opening large and deep, subcircular; fauces cream colored. Length 36, breadth nearly 25 mill.

Fig. 340.



Bulimulus vegetus

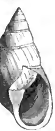
Bulimus pallidior, SOWERBY, Proc. Zool. Soc. 1833, 72, &c.

Bulimus pallidior, PFEIFFER, Mon. Hel. Viv. II, 61, &c.

Bulimus vegetus, GOULD, Bost. Journ. VI, 375, pl. xiv, f. 2 (1853).

Thaumastus pallidior, TRYON, Am. Journ. Conch. III, 170, pl. xiii, f. 9 (1867).

Fig. 341.



Bulimus pallidior.

It seems to inhabit all the peninsula of California, having been found by Mr. Xantus at Cape San Lucas and three hundred and fifty miles above, and by others at San Juan and San Diego. It is found on high Copaiva trees. It is said to inhabit South America.

Jaw with about thirteen separate plates, the outer longitudinal edge of each thickened into costæ; coarse transverse striæ

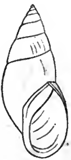
The above is Gould's description. There can be no doubt of the identity of his species with *B. pallidior*.

Fig. 340 is a fac-simile of that of Dr. Gould. Fig. 341 is from a specimen collected by Mr. Xantus.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8332	6	Cape St. Lucas, L. C.	J. Xantus.	= *B. vegetus*, Gld.
8333	6	" "	"	Cab. series.

Bulimulus excelsus, GOULD.—Shell ovate-fusiform, rather solid, smooth, pale coffee-colored, with unequal longitudinal striæ of white shading into each other, white at suture; spire acute, elongated; whirls seven, moderately convex, the last not quite two-thirds the length of the shell; aperture less than half the length of the shell, obliquely subovate, peristome soon becoming revolute, broadly so in front, rising, a little narrowed by a somewhat abrupt curve upon the columella, and expanding again as it rises, until the two extremities of the peristome nearly meet; the columellar portion stands off from the body-whirl, displaying a large umbilical fissure; peristome white, with a brown submargin at the point of reflection. Length 43, breadth 18 mill.

Fig. 342.



Bulimulus excelsus.

Inhabits California and Lower California.

This shell has very much the appearance of *B. lobbii*, Reeve, from Peru; but the aperture is larger and differently proportioned; the colors are less bright, the stripes broader and more blended. *B. pallidior*, Sowerby, has the aperture more like it, but is colorless, and has the spire less elongated. In form it is also much like *B. xanthostoma*, D'Orb. It has the form of *B. membranaceus*, but is much larger and thicker.

Bulimus excelsus, GOULD, Bost. Journ. Nat. Hist. VI, part 3, 376, pl. xiv, f. 3 (Oct. 1853).—PFEIFFER, Mon. Hel. Viv. IV, 384.—W. G. BINNEY, Terr. Moll. IV, 24, pl. lxxix, f. 12.

Bulimus elatus, GOULD, *l. c.* in tab.

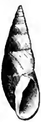
Thaumastus excelsus, TRYON, Am. Journ. Conch. III, 171, pl. xiii, f. 10 (1867).

I have copied the original description of this species.

Fig. 342 is an outline of the original figure.

Bulimulus inscendens, W. G. Binn.—Shell rimate, acuminately oblong, thin, reddish-brown, decussated with striæ of growth and minute revolving lines, the apical whirl and a half being ribbed; suture moderate; whirls seven, convex, the last seven-twelfths the shell's length; aperture oblique, oblong-ovate; peristome simple, acute, reflected at the columella; a thin callus on the parietal wall of the aperture. Length 36, breadth 10; aperture 15 long, 9 mill. broad.

Fig. 343.



Bulimulus inscendens.

Bulimus inscendens, W. G. Binney, Proc. Acad. Nat. Sci. Philad. 1861, 332 (fig.).
Mesembrinus inscendens, Tryon, Am. Journ. Conch. III, 170, pl. xiv, f. 21 (1867).

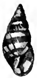
On dry mountains, 800 to 1000 feet high, between Cape San Lucas and Margarita Bay, Lower California, and some three hundred and fifty miles above (*Xantus*), climbing high Copal trees; never found on the low lands or table-lands.

The description is drawn from the most perfect specimen, which is somewhat smaller and more cylindrical than some of the others. On first receiving a single specimen, I was inclined to refer it to *B. excelsus*, Gld. A careful examination of the description of that species, however, and of a specimen lately received, convinces me of its being distinct. Its peculiar characteristic is the strongly ribbed, polished apical whirls, differing from the decussated sculpturing of the remainder of the shell.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
9107	1	Lower California.	J. Xantus.	Type.
8863	2	Cape St. Lucas.	"	......

Bulimulus multilineatus, Say.—Shell subperforate, thin and strong, elongated, ovate-acuminate, smooth and shining, of a bright yellowish-white color, variegated with longitudinal stripes and spiral zones of dark chestnut, of various widths, none of which are constant except a subsutural line, continued to the apex, which is also black; whirls about seven, a little convex; suture delicate; aperture rounded-ovate, a little more than one-third the length of the shell; peristome acute; columella straight, widening upwards, and protecting a minute umbilical opening. Length 25, diam. 10 mill.

Fig. 344.



Bulimulus multilineatus.

Bulimus multilineatus, Say, Journ. Acad. Nat. Sci. Philad.

V, 120 (1825); ed. Binney, 28.—DeKay, N. Y. Moll. 56 (1843).—W. G. Binney, Terr. Moll. IV, 132.—Pfeiffer, Mon. Hel. Viv. II, 204.

Bulimus menkei, Gruner, Wiegm. Archiv. 1841, I, 277, pl. xi, f. 2.—Pfeiffer, Mon. Hel. Viv. II, 176.

Bulimus venosus, Reeve, Con. Icon. pl. xlv, f. 285 (1848).

Bulimus virgulatus, Binney, not Ferussac, Terr. Moll. II, 278, pl. lviii.—Leidy, T. M. U. S. I, 259, pl. xv, f. 7–8 (1851), anat.—Pfeiffer, *l. c.* IV.

Mesembrinus multilineatus, Tryon, Am. Journ. Conch. III, 169, pl. xiii, f. 11, 12 (1867).

Key West and Lower Matacumba Key, Florida. St. Martha, New Granada. Maracaibo and Porto Cabello, Venezuela (cabinet of Mr. Swift).

There is considerable confusion regarding the synonymy of this shell. An immature specimen from Florida was first described by Mr. Say as *Bulimus multilineatus*. It was not again met with until Dr. Binney received specimens from his collector in Florida. From these shells it was described and figured in the Terrestrial Mollusks. Its identity with Mr. Say's species was there recognized, but as *B. multilineatus* was considered a synonym of the West Indian *Bulimus virgulatus*,[1] our shell was placed under that name. In the fourth volume of the Terrestrial Mollusks I restored to the species the original name of *multilineatus*. Among European authors the name is mentioned only by Pfeiffer (Mon. II, 204) as a species unknown to him, and later (IV, 482) as a synonym of *Bul. elongatus*. The last quotation was probably influenced by the treatment of the species in the Terrestrial Mollusks, as he also quotes in the same synonymy the description and figure of that work. It appears to me that Dr. Pfeiffer has described the species from specimens from the Orinoco, under the name of *Bulimus menkei*. While criticizing the plates of the Terrestrial Mollusks (Mal. Blatt. 1859, p. 29) he notices the resemblance of the upper figure to *Bul. menkei* in color.

The name *Bulimus venosus* of Reeve was suggested for the specimens from the banks of the Orinoco, on account of *Bulimus menkeanus* of Ferussac preventing the use of the name *Bul. menkei*.

Specimens resembling those from Florida have been received from Venezuela by Mr. Swift. There can be no doubt of the species having several times been found in Florida as well as in South America.

---

[1] This is now recognized as a synonym of *B. elongatus*, Bolt.

I add below the descriptions of Say and Pfeiffer.

Bulimus multilineatus.—Shell conic, not very obviously wrinkled; whirls not very convex, yellowish-white, with transverse entire reddish-brown lines; a blackish subsutural revolving line; suture not deeply indented, lineolar; apex blackish; umbilicus small, surrounded by a broad blackish line; columella whitish; labrum simple, blackish. Length less than seven-tenths of an inch; greatest breadth less than seven-twentieths of an inch. This species was found by Mr. Titian Peale on the southern part of East Florida. (*Say.*)

Bulimus menkei.—Shell subperforated, oblong-acute, thin, smooth, white with three bands (two confluent, one sutural) and streaks of chestnut; whirls seven, rather convex, the last about equalling two-fifths the shell's length; columella obliquely receding; aperture oval-oblong; peristome simple, acute, black, its columellar termination dilated, arcuately reflected, appressed. Length 21, diam. 9; aperture 9 long, 4½ wide. Near Orinoco, Venezuela. (*Pfeiffer.*)

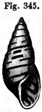
A study of these descriptions will, I believe, convince one of the identity of the Florida and Orinoco shells with *Bulimus multilineatus.* There can be no doubt that the well-known *Bul. elongatus* is quite a distinct species.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8705	2	Lower Matacumba Key, [Fla.	O. Wurdemann.	Cab. series.

SUBGENUS THAUMASTUS, Albers.

Shell imperforate or rimate, conic-oblong, striate, white, streaked with brown; aperture oblong-oval, generally not equalling a half the shell's length; columella distinctly tortuous, often colored; peristome obtuse, straight, or briefly expanded, its columellar margin reflexed, more or less appressed.

Fig. 345.



Bulimulus californicus, enlarged one-half.

Bulimulus californicus, REEVE.—Shell somewhat acuminately ovate, rather thin, scarcely umbilicated; whirls six in number, smooth; columella reflected, lip simple; cream color, encircled with interrupted transverse blue black zones. (*Reeve.*)

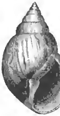
Bulimus californicus, REEVE, Con. Icon. 378.—PFEIFFER, Mon. Hel. Viv. III, 422.—W. G. BINNEY, Terr. Moll. IV, 21, pl. lxxix, f. 15.
Thaumastus californicus, TRYON, Am. Journ. Conch. III, 170, pl. xiii, f. 14 (1867).

California.

I have not seen this species. Fig. 345 is copied from Reeve. I do not agree with Dr. Gould (Terr. Moll. II, 275) in referring the species to *Bulimus serperastrus*, Say.

Bulimulus patriarcha, W. G. BINN.—Shell perforate, ovate, heavy, white, and wrinkled; whirls six, convex, the last ventricose, equalling in length five-sevenths of the shell; aperture ovate; peristome simple, thickened within, the extremities joined by a heavy white callus, the columellar extremity slightly reflected, so as partially to conceal the umbilicus. Length 35, diam. 19; aperture, length 19, diam. 12 mill.

Fig. 346.



Bulimulus patriarcha.

Bulimus patriarcha, W. G. BINNEY, Proc. Acad. Nat. Sci. Philad. 1858, 116; Terr. Moll. IV, 130, pl. lxxx, f. 13.—PFEIFFER, Mal. Blat. 1859, 48.
Thaumastus patriarcha, TRYON, Am. Journ. Conch. III, 171, pl. xiii, f. 15 (1867).

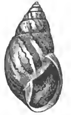
Texas. Mexico, at Buena Vista. (*Berlandière.*)

Named from its greater size and more antiquated appearance, as compared with the allied species, but the young individuals are as readily distinguished as the most mature from any other. It is most nearly related to *B. schiedeanus*, but differs from that species in having a shorter, more rapidly acuminated spire, longer and much more globose body-whirl, more lengthened and narrower aperture, and rougher surface.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8713	2	Buena Vista.	Lieut. Couch.	Type. Cab. series.

Bulimulus alternatus, SAY.—Ovate conic, with alternate gray and brownish longitudinal vittæ. Inhabits Mexico. Shell umbilicated, ovate-conic, with longitudinal lines, unequal, gray and light brownish vittæ; the brown is paler, almost approaching in some instances a drab; the white vittæ consist of more or less confluent, transverse, irregular lines, and small spots; whirls about six, a little convex; suture not profoundly impressed; labrum (in some specimens) with a thickened line or rib on the inner submargin, within white, with a perlaceous tinge. Length one and one-fifth of an inch. Greatest breadth seven-tenths. This species appears to be not uncommon in Mexico, as many specimens were sent me by Mr. Maclure; but from what particular locality, I know not. (*Say.*)

Fig. 347.



Bulimus alternatus.
[Say.]

Bulimus alternatus, Say, New Harmony Diss. Dec. 30, 1830; Descr. 25; ed. Binney, 39.—Pfeiffer, Mon. Hel. Viv. II, 221.—W. G. Binney, Terr. Moll. IV, 126, pl. lxxx, f. 1, 3, 18.

Bulimus dealbatus, Binney, part, Terr. Moll. II, 276, pl. ii a, upper and lower fig., pl. ii b.—Not Say

Bulimus mariæ, Albers, Heliceen, 162.—Pfeiffer, Proc. Zool. Soc. 1858, 23; Mon. Hel. Viv. III, 350; in Chemnitz, ed. 2, 157, pl. xlviii, f. 7, 8.—W. G. Binney, Terr. Moll. IV, 128.

Bulimus binneyanus, W. G. Binney, Ter. Moll. IV, 128.—Not Pfeiffer.

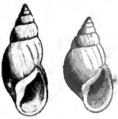
Thaumastus alternatus, Tryon, Am. Journ. Conch. III, 171, pl. xiii, f. 16; pl. xiv, f. 10, excl. f. 12 (1867).

Thaumastus mariæ, Tryon, Am. Journ. Conch. III, 172, pl. xiv, f. 3, 4, 5 (1867).

From Louisiana through Texas into Mexico.[1] It belongs rather to the fauna of Mexico. Found in great numbers upon bushes, the ground below them being often covered with dead shells.

This species is readily distinguished from the allied forms by its greater solidity, its highly polished surface, its more elongated form, its dark colored aperture, bordered with the white internal margin of the peritreme, and the tooth-like callus upon the upper portion of the columella. It varies considerably in form, being sometimes quite slender, at others quite globose. In color it shows every variation from uniform brownish to pure white. The aperture, however, is always dark, and has a white, thickened rim within the peristome. It is most attractive when ornamented with alternate white and brown longitudinal blotches.

Fig. 348.



Bulimulus alternatus.

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[1] Forbes (Proc. Zool. Soc. 1850, 54) mentions a *Bulimus alternatus* from Panama.

There can, I believe, be no doubt that the shell under consideration is what Mr. Say described as *alternatus*. This description is given above, and a copy (Fig. 347) of a colored drawing by Mrs. Say, under which is written, in Mr. Say's hand, "*Bulimus alternatus*, Mexico, Wm. Maclure."

The species was known to Dr. Binney and figured in the Terrestrial Mollusks, but as a variety of *B. dealbatus*. Plate 51 b, and the upper and lower figures of plate 51 a certainly represent the species. The central figures of plate 51 a represent a variety of *B. dealbatus* (*q. v.*), as does also, I should judge, figure 2 of plate 51,[1] though the last may be *B. schiedeanus*.

In vol. 4 of Terrestrial Mollusks I took the same view of *Bul. alternatus* as at present, having the original figure of Mr. Say to assist in determining the species (pl. 80, f. 3). I figured (pl. 80, f. 1) a specimen on which a dark brown color is but slightly broken by white upon the upper whirls. Fig. 15 of the same plate should be also referred to *B. alternatus*. On account of the lesser development of the columellar fold I erroneously referred it to *B. schiedeanus*. On p. 128 I repeated Pfeiffer's description of *Bulimus mariæ*. I had seen no specimen, and admitted the species only temporarily, observing that it must be nearly allied, if not identical with *B. alternatus*. Since that time I have received authentic specimens, and have learnt that *Bul. mariæ* was described from specimens similar to those I have considered as *Bul. alternatus*. While preparing the fourth volume of the Terrestrial Mollusks for publication I sent to Dr. Pfeiffer for identification specimens like those figured on plate 51 b. He returned them with the name *B. binneyanus*. This will account for the use of that name on p. 128. I have subsequently learnt that, deciding the specimens sent to be a variety of *B. mariæ*, he applied the name *B. binneyanus* to quite another species (Proc. Zool. Soc. 1858, pl. xlii, f. 4).

Pfeiffer gives Say's description of *B. alternatus* as a species unknown to him. It is not mentioned by other authors.

Bulimus mariæ, Albers, is referred to *alternatus* from the description, given below, of Albers and Pfeiffer,[2] from the figure in the second edition of Chemnitz, and from authentic specimens in my collection.

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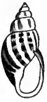
[1] In the explanation of the plates in vol. III, Dr. Gould refers plate 51 b to *Bul. schiedeanus*, pl. 51 a to *lactarius*, and fig. 2 of 51 to *alternatus*.

[2] Plate 51 b of Terr. Moll. is referred by Pfeiffer to a form of *B. mariæ*, pl. 51 a to *lactarius*, which he says may be *alternatus*, and pl. 50, fig. 2 to *schiedeanus*.

Bulimus mariæ.—Shell perforate, ovate pyramidal, striatulate, shining, white, varied irregularly with diaphanous bands and spaced blotches; whirls six and a half, convex, joined by a deep suture, the last a little shorter than the spire; columella somewhat constricted, strongly tuberculate above; aperture oblong-oval, smoky within; peristome whitely labiate within, broadly expanded, its columellar margin reflexed, patent. Length 30, diam. 12; of aperture, length 12, interior breadth 7 mill. *Hab.*—. (*Albers.*)

Fig. 349.



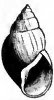
Bulimulus mariæ.

Fig. 349 represents a common form of *Bulimus mariæ.*[1]

Dr. Pfeiffer's description of *B. mariæ* is as follows:—

Shell narrowly umbilicated, oblong-conic, solid, rather smooth, white, often marked with spots and obsolete blotches of horn-color; spire conic, acute; whirls six and a half, rather convex, the last about as long as the spire, hardly attenuated at base; columella with a small dentiform fold; aperture scarcely oblique, acuminately-oblong, brownish within; peristome straight, its right margin somewhat arched, its columellar margin broadened above, spreading. Length 33, diam. 14–15 mill.; of aperture, length 16–17, breadth 7½.

Fig. 350.

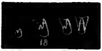


Bulimulus alternatus.

One of the uniformly white forms of the species is figured in Fig. 350, and two of the same from the table-land west of Fort Clark, figured in Fig. 348, show the variation in breadth of which the species is capable.

There are about seventy-six rows of teeth on the lingual membrane of *B. alternatus*, each consisting of 75 (37—1—37) teeth. Central teeth long, simple, bluntly pointed, the laterals bicuspid, modified as they pass off laterally.

Fig. 351.



Lingual dentition of *Bulimulus alternatus.*

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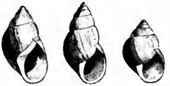
[1] The figure being in outline is unshaded in the aperture, which in the original is dark brown.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8420	14	Tamaulipas, Mex.	Lieut. Couch.	......
8421	2	Matamoras, Mex.	"	......
8692	4	Tamaulipas, Mex.	"	Cab. series.
8982		Leon	Lieut. Beale.	......
8430	8	San Pedro.	......	......
8686	8	Texas.	Lieut. Couch.	......

Bulimulus schiedeanus, PFEIFFER. — Shell perforated, ovate-acute, calcareous, white, with irregular longitudinal wrinkle-like striæ; whirls six and a half, rather convex, the last as long as the spire; aperture oval-oblong, brownish within; columella obsoletely folded; peristome simple, acute, its margins joined with a shining callus, the columellar one broadly reflected, white and shining. Length 31, diam. 17 mill.; length of aperture 17, breadth 9.

Fig. 352.



Bulimulus schiedeanus.

Bulimus schiedeanus, PFEIFFER, Symb. ad Hel. Hist. 1, 43; Mon. Hel. Viv.[1] II, 187; in CHEMNITZ, ed. 2, no. 216, pl. xlvi, f. 3, 4 (1854).—PHILIPPI, Icon. 1, 3, p. 56, pl. 1, f. 12 (1843).—REEVE, Con. Icon. no. 361.—W. G. BINNEY, Terr. Moll. IV, 129.

Bulimus alternatus, BINNEY, Terr. Moll. pl. li, f. 2.—Not of SAY.

Thaumastus schiedeanus, TRYON, Am. Journ. Conch. III, 172, pl. xiv, f. 12 (1867)

Texas and the neighboring part of Mexico. Very common in Washington County, Texas.

From *Bulimulus alternatus* this species is distinguished by a rougher surface, a light-colored aperture, a shorter and more pyramidal spire, and by the want of the highly developed tooth-like fold upon the columella. It is of a dead white color, not variegated with brown blotches. The aperture is shorter and wider, and there is no strong internal white thickening to the peritreme. Like all the species of the group it has a highly polished very light waxen apex. There are sometimes light delicate waxen vittæ upon the first two whirls.

No description of this species was given by Dr. Binney, nor was it figured unless in plate 51, fig. 2, as *B. dealbatus,* var. On p. 278 of vol. 2, Dr. Gould erroneously refers to it pl. 51 b.

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[1] Pfeiffer quotes also as synonyms the manuscript names *B. xanthostomus,* Wiegm., and *B. candidissimus,* Nyst.

There is a great difference in the comparative globoseness of the various specimens.

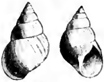
The shell figured as a variety of *B. schiedeanus* with a dark colored aperture in the fourth volume of the Terrestrial Mollusks (pl. 80, f. 15) is rather a specimen of *Bul. alternatus*, in which the columellar fold is not as strongly developed as usual. Fig. 8 of the same plate I describe below as variety *mooreanus*.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8427	19	Tamaulipas, Mex.	......	......
8428	16	....	......	......
8429	1	Texas.	G. Wurdemann.	......
8688	4	Washington Co., Texas	W. G. Binney.	......
8807	20+	Texas.	"	Cab. series.
9137	1	Cienaga Grande.	......	......

Variety **mooreanus.**—Shell perforated, ovate-conic, thin, white, with a dark lead-colored apex, and below the middle of the body-whirl of a light coffee color; smooth, with microscopic revolving lines: whirls seven, convex, the last equalling about two-thirds the shell's length; aperture ovate, light within, columella straight; peristome acute, very thin, with an internal delicate white rim, its margins unconnected with callus, that of the columella broad, white, slightly reflected. Length 25, breadth 12 mill.

Bulimus schiedeanus, var., W. G. Binney, Terr. Moll. IV, 129, pl. lxxx, f. 8.

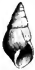
Fig. 353.



Bulimulus mooreanus.

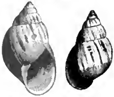
Found in large numbers in Washington and DeWitt Counties, Texas, by Dr. F. W. Moore, and at Leon by Lieut. Beale.

Fig. 354.



Bulimulus mooreanus.

Fig. 355.



Bulimulus mooreanus, var.

It is a more fragile, highly polished shell than *B. schiedeanus*, and is peculiar in having the dark apex and the body-whirl light coffee-colored below the upper margin of the aperture. In one case only have I observed the whole shell of this color, it was then of a darker hue. There is an extremely light, transparent callus on the parietal wall of the aperture.

To this variety also are to be referred specimens having delicate longitudinal light wax-colored patches.

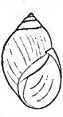
Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
5657	3	Texas. Washington Co.	Dr. F. W. Moore.	......

SUBGENUS **MORMUS**, Albers.

Shell rimate, oblong-conic, striate or costulate, thin, white, often variegated with brownish; whirls 6–7, the upper ones somewhat flattened, the last rather tumid; aperture equalling about half the shell's length, subovate; peristome simple, straight, its columellar margin dilated, reflected.

Bulimulus sufflatus, GOULD.—Shell ovoid, thin, milk white, delicately and regularly striate; spire short; whirls five and a half, inflated, the last one more than three-fourths the length of the shell, nearly symmetrical in form at both extremities; aperture somewhat more than half the length of the shell, narrow lunate; lip simple; columella broadly reflected over a narrow umbilical fissure; a thin glazing of callus on left lip. Length 1¼, breadth seven-tenth inch.

Fig. 356.



Bulimulus sufflatus. [GOULD.]

Inhabits Lower California. (*Gould.*)

Bulimus vesicalis, GOULD, Bost. Journ. Nat. Hist. VI, 375, pl. xiv, f. 1 (1853).—PFEIFFER, Mon. Hel. Viv. IV, 467.—GABB, Am. Journ. Conch. III, 237, pl. xvi, f. 6 (1867).

Bulimus sufflatus, GOULD in litt.—W. G. BINNEY, Terr. Moll. IV, 25.—PFEIFFER, Mal. Blatt. 1859, 45.

Mormus sufflatus, TRYON, Am. Journ. Conch. III, 172, pl. xiv, f. 6 (1867).

An outline of Dr. Gould's figure is given above. Specimens lately collected by Dr. Gabb from La Paz are quite solid, and have a thickened peristome.

Fig. 357.

Bulimulus pilula.

Bulimulus pilula, W. G. BINNEY.—Shell globose, inflated, umbilicated, thin, with longitudinal wrinkles, chalk-colored; apex obtuse; whirls four, convex, the last very inflated, equalling ten-elevenths the length of the whole shell; columella simple, arched; aperture oblique, rounded; peristome simple, acute, its columellar end expanded so as partially to cover the umbilicus. Length 22, breadth 7; of aperture, length 9, breadth 6 mill.

Bulimus pilula, W. G. Binney, Proc. Acad. Nat. Sci. Phila. 1861, 331 (fig.).
Mormus pilula, Tryon, Am. Journ. Conch. III, 173, pl. xiv, f. 7 (1867).

Lower California, at Todos Santos Mission and Marguerita Island. (*Xantus.*)

Mr. Xantus found many of this species during his stay on the peninsula, and is decidedly of the opinion that maturer specimens, if any existed, would have been noticed by him. It frequents rocky spots, living under mosses.

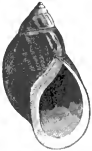
I can find no figure in Reeves' Monograph or description in Pfeiffer's works of any species at all approaching it in shape. The measurements are taken from the largest individual. All the specimens are uniform in outline and other respects.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
9019	3	Todos Mission.	J. Xantus.	Type.

Subgenus **SCUTALUS**, Albers.

Shell perforate or umbilicate, ovate-conic, regularly striate, rough, brownish-white, usually variegated; whirls 4–7, the last ventricose, more or less accurately equalling the spire, compressed at the base; aperture oblong-ovate, peristome more or less expanded, often reflexed, lightly thickened within.

Fig. 358.



Bulimulus proteus.

Bulimulus proteus, Broderip.—Shell umbilicated, ovate-conic, thin, crowdedly granulated and striate, dull white, varied with smoke color; whirls six, rather convex, the last equalling the spire; umbilicus rather large, pervious; aperture suboval; peristome thin, acute, broadly expanded, its ends converging, the columellar portion very broad, flat, effuse. Length 40, diam. 19; of aperture 19 long, 10 mill. wide, within.

Bulimus proteus, Broderip, Proc. Zool. Soc. London, 1832, 107.—Pfeiffer, Mon. Hel. Viv. II, 61 (which see for further synonyms).—W. G. Binney, Proc. Acad. Nat. Sci. Philad. 1861, 331.
Bulimus sordidus, Lamarck,[1] not Lesson, teste Pfr.
Scutalus proteus, Tryon, Am. Journ. Conch. III, 173, pl. xiv, f. 8 (1867).

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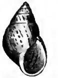
[1] *B. proteus*, Guild. = *B. elongatus.*

Cape St. Lucas. (*Xantus*). No. 8564 of the collection agrees perfectly with the figure given by Deshayes and Ferussac, pl. 133, f. 1, 2. The bands of coloring are longitudinal in this specimen, and not transverse as in Reeve's figure. Numerous young shells were also collected by Mr. Xantus. Pfeiffer gives the mountains of Peru as habitat of the species. It is also quoted from Campaña de Quillota, Chili.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8564	1	Cape St. Lucas, Cal.	J. Xantus.	Cab. series.

Bulimulus dealbatus, SAY.—Shell umbilicated, ovate-conical, or rather ventricose, thin, white, with longitudinal lines and blotches of ash; suture impressed; whorls six to seven, ventricose, acuminate, the last equalling the spire; aperture oval; peristome acute, rarely a little thickened within, somewhat reflected at its columellar portion, and partially hiding the umbilicus. Length of axis 18 mill., diam. 12 mill.

Fig. 359.



Bulimulus dealbatus.

Helix dealbata, SAY, Journ. Phila. Acad. II, 159 (1821); ed. BINNEY, 20.

Bulimus dealbatus, POTIEZ & MICHAUD, Galerie, I, 139, pl. xiii, f. 3, 4.—PHILIPPI, Icon. I, p. 158, pl. ii, f. 6 (1844).—PFEIFFER, Mon. Hel. Viv. II, 187; in CHEMNITZ, ed. 2, p. 55.—REEVE, Con. Icon. f. 455.—BINNEY, Terr. Moll. II, 276, pl. ii, f. 1; pl. ii a, excepting upper and lower fig. ?.—W. G. BINNEY, Terr. Moll. IV, 130, pl. lxxx, f. 6, 7.

Bulimus confinis, REEVE, Con. Icon. 643 (1850).—PFEIFFER, Mon. Hel. Viv. III, 341.

Bulimus liquabilis, REEVE, Con. Icon. 387.

Bulimus lactarius, MENKE in PFEIFFER,[1] Mon. II, 187.—REEVE, Con. Icon. 217.—GOULD, Terr. Moll. III, 35.

Scutalus dealbatus, TRYON, Am. Journ. Conch. III, 173, pl. xiv, f. 9 (1867).

Found from North Carolina to Missouri and Texas. Very common in Central Alabama, where immense beds of semifossilized shells are found, several feet below the surface.

This species, when found in Northern Alabama, is about three-fourths of an inch in length, is quite thin, almost transparent, with a thin peritreme. In more southern localities its size is greater, its shell thicker, its coloring richer, and within the aperture the peritreme is margined with a broad white callus. Under such circumstances it bears considerable resemblance to *B. alternatus*, but the interior of the aperture never has the dark coloring of that species, nor is the columella furnished with the tooth-like fold. It is especially in Texas that it is found in such perfection. I have no doubt that the specimens figured on pl. 51 a of the Terrestrial Mollusks came from that State.

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[1] Pfeiffer quotes as synonym the unpublished name of *Bulimus galeottii*, NYST.

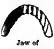
It is this last described form of the species which has been called *Bulimus lactarius*. I have seen no authentic specimen, but from Pfeiffer's description (see Terr. Moll. IV, 128), and his reference to all but the lower figure of plate 51 a (Mon. IV, 476), there remains no doubt of the identity of the two.

The variation in the globoseness of the whirls, and consequent outline of the shell, may be judged from the following measurements of two specimens: diam. 18, length 25; diam. 7, length 19 mill.

Of *Bulimus liquabilis* and *confinis* I have given the original description and a fac-simile of the original figures in the fourth volume of the Terrestrial Mollusks.

The jaw of *Bulimulus alternatus* is narrow, strongly arched, with distant anterior ribs, denticulating the concave margin. It does not agree with the description of the jaw of the subfamily *Orthalicinæ* (p. 212).

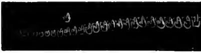
Fig. 360.



Jaw of *Bulimulus dealbatus.*

The lingual membrane consists of 94 rows of teeth, 25—1—25 in each row. Central teeth long, tricuspid, laterals bicuspid, the cusps modified as the teeth pass off laterally.

Fig. 361.

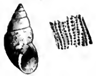


Lingual dentition of *Bulimulus dealbatus.*

Cat. No.	No. of Sp.	Locality.	From whom received	Remarks.
8425	5	Dallas County, Ala.	......	......
8426	3	Texas.	Dr. B. F. Shumard.	......
8689	4	Alabama.	W. G. Binney.	Cab. series.
8690		Texas.	Lieut. Couch.	"
8958		Hot Springs, Ark.	Dr. B. Powell.	......
8979		San Felipe Spr.	Lieut. Beale.	......
8983		Leon.	"	......

Bulimulus xantusi, W. G. BINNEY.—Shell rimate, oblong-ovate, chalky-white, marked with numerous longitudinal wavy striæ and decussating minute revolving lines; suture impressed; whirls five and a half, convex, the last five-sevenths the length of the shell; columella arched; aperture oblique, oval; peristome simple, sharp, its ends somewhat approaching, that of the columella reflected; the parietal wall of the aperture covered with a light callus. Length 21 mill., breadth 8; of aperture, length 10, breadth 6.

Fig. 362.



Bulimulus xantusi.

Bulimus xantusi, W. G. BINNEY, Proc. Acad. Nat. Sci. Philad. 1861, 331 (fig.).

Scutalus xantusi, TRYON, Am. Journ. Conch. III, 173, pl. xiv, f. 9 (1867).

Cape San Lucas, Lower California. Mr. Xantus collected four specimens agreeing in size and other characteristics. The peculiar wavy striæ and minute revolving lines are its especial characteristics.

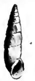
Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
9018	1	Cape St. Lucas.	Xantus.	Type.

SUBGENUS PERONÆUS, Albers.

Shell perforated, oblong-turreted or subulate; white, generally streaked with horn-color; whirls 8–11, convex, the last equalling about one-third the shell's length; aperture oblong or oval, columella receding or obsoletely arcuated; peristome expanded, not thickened, its columellar margin dilated, patent.

Bulimulus artemisia, W. G. BINN.—Shell rimate, subcylindrical, broadest at the second whirl, from which it gradually tapers towards the apex, which is obtuse, its first whirl and a half being bulbous, and marked by numerous strong longitudinal ribs, white, nearly transparent, the longitudinal wrinkles of growth scarcely roughening the almost smooth surface; suture distinct; whirls eight, flattened, regularly and gradually increasing, the last equalling one-half the whole length of the shell; aperture oblique, oval; peristome simple, hardly thickened, its terminations approached, and made continuous by a white, upright callus, the columellar portion expanded. 23 mill. long, 6 wide; aperture 7 long.

Fig. 363.



Bulimulus artemisia.

Bulimus artemisia, W. G. BINNEY, Proc. Acad. Nat. Sci. Philad. 1861, 331 (fig.).

Peronæus artemisia, Tryon, Am. Journ. Conch. III, 174, pl. xiv, f. 22 (1867).

But one specimen was found on a small species of *Artemisia*, at Cape San Lucas, Lower California, by Mr. J. Xantus.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
9017	1	Cape St. Lucas.	J. Xantus.	Type.

Spurious Species of Bulimulus, &c.

Bulimus radiatus, Lamarck, is attributed to the western prairies in Wheatley's Catalogue of U. S. Shells, 21.

Bulimus neglectus, Pfr., has been erroneously referred to Texas (Mart. & Alb. Helio. 188).

Bulimus acutus, Müller, is quoted, without description, from N. A. by Forbes (Br. Ass. Rep. 1840, 145). See also Bost. Journ. Nat. Hist. III. 409.

Bulimus octona, Brug., has been found in greenhouses and gardens, where it has been introduced on plants.

Bulimus exiguus, Binn., is the same as *Carychium exiguum*.

Bulimus fasciatus, Binn., is the same as *Achatina fasciata*.

Bulimus gossei, Pfr., *vid. Macroceramus kieneri*, Pfr.

Bulimus kieneri, Pfr., *vid. Macroceramus kieneri*.

Bulimus lubricus, Ad. &c., is the same as *Zua lubrica*.

Bulimus obscurus, Dr., *vid. Pupa placida*, Say.

Bulimus striatus, Brug., is the same as *Glandina truncata*.

Bulimus vexillum, Brug., is the same as *Achatina fasciata*.

Bulimus vermetus, Anthony, is unknown to me. He thus describes it (Cover of Haldeman's Monograph No. 3, July, 1841): Shell turriculated, livid brown; whirls five, striated longitudinally; suture deeply indented; apex entire; body-whirl a little more than equal to the spire; spire two and a half times the length of the aperture; length 3, width 1½ lines; aperture obliquely ovate; length of the aperture equal to the width of the body-whirl. Ohio, near Cincinnati.

Distinguished by its peculiar mouth, which is curved in a regular curve from right to left, contracted at the upper angle, and spreading below; the whirls are also very deeply indented, and twisted as they are in *Succinea vermeta*.

Bulimus mexicanus, Lamarck, and

Bulimus humboldti, Reeve, have been doubtfully referred to Mazatlan.

Bulimus laurentii, Sowerby, Sitka, is, I presume, from Sitcha, San Salvador, not from the northwest coast (see Terr. Moll. U. S. IV, 25).

Bulimus acicula, Müll., T. M. IV, 137, *vide Acicula acicula*.

Bulimus marginatus, W. G. Binn. = *Pupa fallax*.

Bulimus modicus, W. G. Binn. = *Pupa modica*.

Bulimus chordatus, Pfr. = *Pupa chordata*.

Bulimus decollatus and *B. mutilatus*, Say = *Stenogyra decollata*.

Bulimus subulus, W. G. Binn. = *Stenogyra subula*.

Bulimus gracillimus, W. G. Binn. = *Stenogyra gracillima*.

Bulimus harpa, Binn. = *Helix harpa*.

Bulimus carinatus, Brug., Encycl. Méth. I, 301 (1792); Bosc, IV, 89 (*Buccinum*, Lister & Petiver), is an exotic Melanian, not inhabiting Virginia.

Bulimus urceus, Brug., Encycl. Méth. I, 298 (1792), from Mississippi River = *Ampullaria*, *q. v.*

Melania striata, Perry, Conch. pl. xxix, f. 5, "New California," is *Bulimus melania*, Ferussac.

Fossil Species of Bulimulus, &c.

Bulimus limneiformis, Meek & Hayden, Proc. Acad. Nat. Sci. Philad. 1860, 431 = *B. nebrascensis*, *l. c.*

Bulimus floridanus, Conrad, Sill. Am. Journ. Sc. [2], II, 399.

Bulimus perversus, Meek & Hayden = *Clausilia contraria*, M. & H.

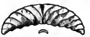
Subfamily ORTHALICINÆ.

Jaw composed of numerous separate plates. Teeth of the lingual ribbon uniform, short, bicuspid.[1]

ACHATINA, Lam.

Shell oblong, aperture longitudinal or oval, angulated above; columella truncated towards the base of the aperture; peristome simple, acute.

Fig. 364.



Jaw of *Achatina virginea*.

Jaw composite.

Lingual membrane very broad with numerous similar stout teeth, apex recurved; central teeth long, narrow, simple.

Subgenus LIGUUS, Montf.

Shell imperforate, solid, elongate-conic, apex acuminated, variously fasciated; whirls 7–8, the last equalling about one-third the shell's length; columellar constricted, distinctly truncate in adult individuals; aperture lunate-oval, subangulated; peristome straight, acute, its margins joined by an entering callus.

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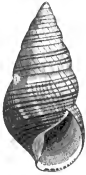
[1] The lingual ribbon of *Orthalicus undatus*, as figured below, and *Achatina fasciata* do not agree with this description.

Animal (of *A. fasciata*) dark brown, or chocolate color, over the whole body; surface very prominently granulated; eye-peduncles very long when extended, thick at their base, ocular points black and small; tentacles long, conical, rounded at the extremities; collar lead-color; extremity of foot usually rounded; when in motion, the whole foot glides smoothly forward, without any perceptible alternate motion of the margins.

Achatina fasciata, Müller.—Shell imperforate, conical, rather thick, smooth, shining, minutely striated; whirls seven to eight, convex, decreasing in diameter gradually and regularly from the body-whirl to the apex; suture impressed; apex obtuse, commonly white, sometimes rosy; aperture suboval, purely white internally, sometimes with a thickened ridge within, and parallel to the peristome; peristome acute, sometimes crenate; columellar margin with a thin callus, sometimes rosy; columella subtruncate in the young, entire in the mature shell, imperforate; surface beautifully variegated with broad, entire or interrupted bands, lines, and spots of brown, with bands and lines of green and yellow, and with lines of rufous, revolving upon the whirls from the apex to the aperture, but more distinct upon the outer whirls; a single system of coloring prevails in some shells, while in others there is a mingling of all of them upon the same specimen. Extreme length 53, diam. 23 mill.

Fig. 365.



Achatina fasciata.

Buccinum fasciatum, Müller, Verm. II, 145 (1774).
Bulla fasciata, Chemnitz, Conch. IX, t. cvli, f. 1004–1006.
Bulimus vexillum, Bruguières, Encycl. Méth. no. 107.
Helix vexillum, Férussac, Hist. pl. cxxl.
Achatina vexillum, Lamarck, An. s. Vert. 2d ed. VIII, 298.—Not of DeKay.
Achatina crenata, Swainson, Illust. pl. lviii.
Achatina pallida, Swainson, Ill. pl. xli.
Achatina fasciata, Swainson, Ill. pl. clxii.—Reeve, Conch. Syst. II, f. 12. —D'Orbigny, Moll. Cub. I, 172, pl. vi, f. 1–7.—Pfeiffer, Mon. Hel. Viv. II, 245.—W. G. Binney, Terr. Moll. IV, 138.

Achatina solida, Say, Journ. Phila. Acad. V, 122 (1825); ed. Binney, 29.—DeKay, N. Y. Moll. 56 (1843).—Pfeiffer, Mon. Hel. Viv. II, 246.

Agatina variegata, Rafinesque, Enum. and Acc. 3 (1831); ed. Binney and Tryon, 68.

Bulimus fasciatus, Binney, Terr. Moll. II, 266, pl. lv, lvi, lvii.—Leidy, T. M. U. S. I, 252, pl. v (1851), anat.

Liguus fasciata, Tryon, Am. Journ. Conch. III, 165, pl. xii, f. 1–5, 6 (1867).

Liguus picta, Tryon, *l. c.* 165, pl. xiii, f. 4 (1867).

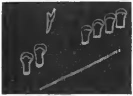
Lister, Icon. *l. c.* t. xii, f. 7.—Gualt, *l. c.* t. vi, f. C. D.—D'Argenville, *l. c.* pl. xi, f. M.

Southern part of Florida and islands and keys adjacent to the coast, probably introduced from Cuba.

This species inhabits trees, upon the branches of which it is found. In winter it hibernates by attaching its aperture very strongly to the bark of the tree, by means of a thick, viscid, opaque secretion, which hardens to the consistency of glue. In tearing it away, the bark or the shell is fractured sooner than the secretion. At other times, when the animal withdraws into the shell, it secretes only a thin, transparent epiphragm.

Jaw (Terr. Moll. I, pl. v, f. 4 a, b) slightly arched, ends pointed; composed of numerous plates.

Fig. 366.



Lingual dentition of *Achatina fasciata*.

The lingual membrane has 94 rows of 55—1—55 teeth each, arranged diagonally across the membrane; teeth similar, stout, blunt, broader above than below, apex recurved.

The left-hand figure of Terr. Moll. pl. lvi, may be *A. picta*, Reeve (Con. Icon. f. 34).

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8699	2	Key Biscayne, Fla.	G. Wurdemann.	Cab. series.
8700	1	Indian Key, Fla.	"	"
8701	4	" "	"	"

Doubtful Species of Achatina.

Liguus virgineus, Montfort, Conch. Syst. II, 423, Louisiana. (*A. virginea*, Jay, Wheatley. *Bulimus vexillum*, DeKay.)

Achatina lubrica, Binney. See *Zua*.

Achatina bullata, Pfr. See *Glandina*.

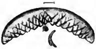
Achatina truncata, Pfr. See *Glandina*.
Achatina vanuxemensis, Lea. See *Glandina*.
Achatina rosea, Deshayes. See *Glandina truncata*.
Achatina striata, DeKay, is *Glandina truncata*. See Terr. Moll. IV, 139.
Achatina subula, Pfr. See *Stenogyra*.
Achatina texasiana, Pfr. See *Glandina*.
Achatina australis, Villa, N. Am., Disp. 19.
Achatina pellucida, Pfr. See *Blauneria*.
Achatina gracillima, Pfr. See *Stenogyra*.
Achatina flammigera, Say (ed. Binney, 29) = *Orthalicus undatus*.
Achatina flammigera, Ferussac. See Terr. Moll. IV, 138.

ORTHALICUS, Beck.

Shell imperforate, ovate or oblong, ornamented with often articulated fillets, apex obtuse, last whirl inflated; columella filiformly thickened, sometimes callous, arcuate, obliquely subtruncate at base; aperture longitudinal, oval.

Jaw heavy, semilunar, composed of 16–22 semitriangular, free, imbricated plates, crenulated on the external free side.

Fig. 367.



Jaw of *Orthalicus zebra*.

The lingual membrane, as described under *Orthalicinæ*, on page 212, has uniform, short, bicuspid teeth. As stated in the foot-note to the same page, the lingual membrane of *Orthalicus undatus* does not agree with this.

Lingual membrane large, broad, covered with large, numerous, almost equal papillæ arranged in numerous, almost straight series, and furnished at the middle of their base with oblong, subquadrate, dilated, hooked denticles.

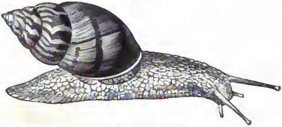
The genus *Orthalicus* does not properly belong to the fauna of North America. It is common in the West India islands, from whence specimens have become introduced to the Florida Keys. It is also found at Mazatlan, on the Pacific coast.

Subgenus ORTHALICUS, Beck, s. str.

Shell imperforate, ovate or oblong-conic, thin, striated, decussated with curling lines, and ornamented with usually articulated fillets and oblique swaths; whirls 6–8, the last inflated; columella filiform, loosely arcuated-intorted, obliquely subtruncated at base, aperture oval, peristome straight, its margins connected by a light callus.

Animal heliciform, large, scarcely included in the shell, oviparous; eggs moderate, oblong-subrotund, with a granulately-roughened, thick, calcareous covering.

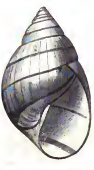
Fig. 369.



Animal of *Orthalicus undatus.*

Orthalicus zebra, MÜLL.—Shell ovate, conic, imperforate, rather thin, surface shining, smooth, scarcely broken by the very delicate incremental striæ; cream-colored, on the body-whirl darker; ornamented upon the body-whirl with three brownish narrow bands, the upper one very delicate, half way between the suture and the upper extremity of the peristome, the central one narrower, but very much darker, commencing at the upper extremity of the peristome, the third broader than the first, very dark, lighter at the edges, commencing at the centre of the parietal wall of the aperture; but one central, narrow, light band upon the upper whirls, two oblique bands marking the earlier peristomes; spire conic, apex pointed with dark brown; whirls six, convex, the last ventricose, three times as long as the spire; columella thickened with white callus, rather straight; aperture oblique, oval, within white, showing the bands; peristome thin, acute, broadly margined with black both without and within, its extremities joined with a shining,

Fig. 370.



Orthalicus zebra.

chestnut, thin, deeply entering callus. Length 48, breadth 26; of aperture, length 27, breadth 14 milli.

Buccinum zebra, Müller, II, 188, no. 331.

Orthalicus zebra, Shuttleworth, Notit. Mal. 62, pl. viii, f. 3, 4 (1856).—Pfeiffer, Mon. Hel. Viv. IV, 588.

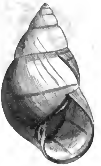
Helix (*Cochlostyla*) *undata*, Férussac, Tab. Syst. 52, no. 337; Illust. pl. cxv, f. 3, 5 (*fide* Beck), f. 6?

Bulimus zebra, W. G. Binney, Terr. Moll. IV, pl. lxxviii, f. 12.—Var. Reeve, Con. Icon. pl. xxvii, f. 90 h?

Vide also Seba, Thes. III, pl. xxxix, f. 50, 51.

Not *Bulimus zebra*, Binney, Terr. Moll.

Fig. 371.



Orthalicus zebra.

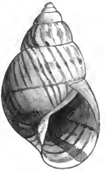
The specimen figured (Fig. 370) was collected at Key Biscayne, Florida. It is also quoted from Maranhon. It must be remembered that this is not the same shell as figured on plate 54 of the Terrestrial Mollusks, which is *O. undatus.*

The species is also found in Mexico. An individual, collected by Mr. J. Xantus in the Sierra Madre, is here figured (Fig. 371). It is from this that I extracted the jaw and lingual membrane figured on p. 215.

Cat. No	No. of Sp.	Locality.	From whom received.	Remarks.
8703	1	Indian Key, Fla.	O. Wurdemann.	Cab. series.
8326	5	Tomla Taiasco, Mex.	Xantus.	......

Orthalicus undatus, Brug.—Shell imperforate, subconical, rather thick, smooth, incremental striæ fine, whitish, with longitudinal, irregular, undulating or somewhat zigzag, dark-brown bands and clouds, intersected by straight, revolving lines of the same color; the body-whirl often with one or more straight, brown lines, at irregular intervals, indicating the former margins of the aperture; spire conic, apex obtuse; whirls six to seven, diminishing in diameter rapidly, body-whirl capacious, occupying two-thirds of the whole length of the shell; aperture ample, ovate, showing the external colors within; peristome simple, acute, bordered with dark brown, or black, both internally and externally; parietal wall with a thin, shining,

Fig. 372.



Orthalicus undatus.

brownish, entering callus; columella slightly thickened, not reflected, nor truncate, making a continuous curve with the peristome. Common length of axis about 50 mill., diameter of large whirl rather more than 25 mill.

(*Bulla*) *Zebra mulleri*, Chemnitz, IX, P. 2, p. 24, pl. cxviii, f. 1815, 1816.
Helix (*Cochlostyla*) *undata*, Férussac, Tab. Syst. p. 32, no. 337; Hist. pl. cxv, f. 1, 4; pl. cxiv, f. 5, 6.
Bulimus (*O.*) *undatus*, D'Orbigny, Cuba, I, 174, pl. vi, f. 9, 10.
Bulimus zebra, Binney, Terr. Moll. II, 271, pl. liv.—W. G. Binney, Terr. Moll. IV, pl. lxxvii, f. 13?—Pfeiffer, Mon. Hel. Viv. II, 143.
Orthalicus undatus, Shuttleworth, Not. 63, pl. iii, f. 4, 5.—Pfeiffer, Mon. Hel. Viv. IV, 589.—Tryon, Am. Journ. Conch. III, 166, partly only, pl. xiii, f. 1, 2, not 3 (which is *O. zebra?*) (1867).
Bulimus reses, Say, New Harm. Diss. Dec. 30 1830; Binney's ed., p. 39.
Agatina fuscata, Rafinesque, Enum. and Acc. p. 3 (1831); Binney's and Tryon's complete edition, 68.

Animal thick and massive, dirty, or yellowish-white, darker on the middle of the back; surface rugose, with prominent, oblong glands, and deep furrows. Whole length, exclusive of eye-peduncles, three inches. Eye-peduncles, when fully extended, one inch long, bulbous, with small, black, ocular points; tentacles one-fifth of an inch long, slender. Orifice of generation behind the tentacle on the right side. Mantle somewhat bilobed, protruding beyond the aperture, and slightly reflected. Posterior extremity rounded, sides corrugated, lower surface smooth, squalid.

Found in Jamaica and Cuba, and at Key West; also at Mazatlan. The specimens figured in the Terrestrial Mollusks were received from the southern part of the peninsula of Florida.

This species inhabits trees. It attaches itself to the tree during hibernation, and covers its aperture by an opaque, inspissated, glutinous secretion, which, though exposed to wind and rain, forms a perfect adhesion and protection to the animal, and only yields to its own solvent powers on the approach of spring. It exists in great numbers; and the dead shells are a favorite habitation of a species of hermit crab.

The figure of the animal of *Orthalicus* given on p. 216, is reduced from a drawing prepared for the Terrestrial Mollusks, but not there figured. On plate 77, fig. 13, of vol. IV, I have given another view of the same shell, also prepared for publication in the Terrestrial Mollusks. I am not certain from what locality the shell was received, but from the fact of Dr. Binney describing in his work no shells but what he knew to exist in the United States, I am inclined to believe he received it from Florida. His collector would be more likely to furnish him with a living specimen from that point, than he to receive it from some Mexican or South American locality. I do not know to which species it may be referred, but presume it to be *B. undatus*. He thus describes it:—

> The most beautiful form of the species is that figured in plate liv, a. It is quite thick and ponderous; its general color is deep brownish, variegated with undulating intervals of white on the spire, and others more obscure on the columellar side of the body-whirl. On the side opposite to the aperture, the brown color is relieved only by three indistinct and ill-defined dark bands, and by the black line showing the margin of a former peristome. The columella is considerably thickened and folded; and the columellar margin is covered by a black callus; and the peristome is broadly margined internally with black; further in, the aperture is purely white.

Mr. Say no doubt referred to *O. undatus* under the name of *Achatina flammigera*, Fer. (ed. Binney, p. 29). He mentions also the manuscript name of *reses*, which he had intended to give to a shell found on trees at the southern extremity of east Florida, but which he afterwards found to be *Bulimus undatus*, Brug.

Rafinesque's description of *Agatina fuscata* will be found on p. 50 of Terr. Moll. I. The locality (Louisiana) is doubtful.

Cat. No	No. of Sp.	Locality.	From whom received.	Remarks.
3474	2	Taboga, Mex.	......	Cab. series.

MACROCERAMUS, Guild.

Shell turreted or lengthened-conic, rimate; whirls 9–15, gradually increasing, the last often angular; aperture round, short, columella usually plicate; peristome expanded, its margins subequal, subparallel, not continuous, the external arched, the columellar dilated, reflected.

Jaw (of *M. signatus*[1]) very strongly arched, composed of

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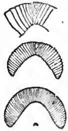
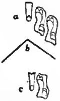
[1] Bland, Ann. N. Y. Lyc. VIII, 162, f. 5, 6 (1865).

Fig. 373.



Jaw of *Macroberamus signatus.* [BLAND.]

Fig. 374.



Lingual dentition of *Macroceramus signatus.* [BLAND.]

numerous separate plates, converging towards and crenulating the cutting margin.

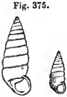
Lingual dentition (of *M. signatus*[1]): Teeth arranged en chevron. Central plate narrow with one small obtuse denticle, laterals with one prominent tooth supporting two denticles and a small one at base.

SUBGENUS **MACROCERAMUS**, Gould. s. str.

Shell striate or costulate, conical, often turreted, white, variegated with brownish; apex whole; whirls 9–12; aperture rounded-quadrangular, not effuse.

Animal (of *M. kieneri*) whitish, translucent, a little darker above the head; body very short, terminating in a blunt extremity; eye-peduncles of moderate length, of nearly equal diameter throughout, terminating in a rounded bulb; tentacles very short, nearly rudimentary; ocular points large and black.

Fig. 375.



Macroceramus kieneri.

Macroceramus kieneri, PFEIFFER.—Shell fusiform, attenuated-cylindrical, whitish, or grayish clouded and marbled with brown; spire acuminate; whirls from nine to thirteen, rounded, with numerous oblique, prominent striæ or ribs; suture impressed, crenulated by the extension of the alternate ribs across it; aperture rounded, oblique; peristome thin, somewhat reflected; axis impressed, not truly perforate; on the last whirl a colored line revolves: this is sometimes raised a little from the surface, and sometimes is sharp like a delicate carina. Length 18, diam. of antepenultimate whirl 6; of aperture, length 4½, breadth 4½ mill.

Pupa unicarinata, BINNEY, Terr. Moll. I, not LAMARCK.
Bulimus kieneri, PFEIFFER, Proc. Zool. Soc. 1846, 40; Mon. Hel. Viv. II, 79; in CHEMNITZ, ed. 2, 131, pl. xiii, f. 23, 24.—REEVE, Con. Icon. 463.

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[1] Bland, Ann. N. Y. Lyc. VIII, 162, f. 5, 6 (1865).

Cylindrella pontifica, Gould, Proc. Bost. Soc. Nat. Hist. III, 40 (1848); Terr. Moll. II, 306, pl. lxix, f. 1.—Chenu, Man. de Conch. I, 446, f. 3305, 3306 (1859).
Macroceramus pontificus, W. G. Binney, Terr. Moll. IV, 137.
Macroceramus kieneri, Pfeiffer, Mon. Hel. Viv. IV, 689.

Florida, from Tampa Bay to Key West. Also Cape Florida and Key Biscayne. Also Cuba.

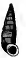
When in motion, the axis of the shell is parallel with the line of progress, and lies almost horizontally. The rapidity with which the animal moves is quite surprising. The advance seems to be effected in this way: The posterior point of the disk of the foot, being detached from the object on which it rests, is carried forward by muscular contraction and again fixed, leaving a curve between the attached point and the next anterior part of the disk, which is not yet detached. This operation is continued throughout the whole disk, every part of which becomes successively detached, curved upward, and again attached, from the extremity to the snout, exhibiting in action a curved or wavy motion, or undulation, commencing at the extremity, proceeding rapidly forward, and terminating at the head. But before one muscular wave is exhausted at the head, another has begun to flow; so that two series of undulations are visible at one time. With this double alternation of action, the body is propelled with a rapidity greater than can be attained by the more common, gliding motion of the *Helices*. During motion the eye-peduncles are extended, and remain steadily in one position.

They are found in woods, on the ground, under leaves, but are not very plentiful. The most northern point where they have hitherto been noticed is Tampa. On the eastern shore of the peninsula, they occur at Cape Florida, and also at Key West and Key Biscayne.

Cat. No	No. of Sp.	Locality.	From whom received.	Remarks.
8702	1	Florida.	W. O. Binney.	= *pontificus* teste A. A. G. Cab. ser.

Macroceramus gossei, Pfeiffer.—Shell rimate, turrito-cylindrical, obliquely ribbed, white, opaque, with semilunar blotches and pellucid, horn-colored spots; spire cylindraceous, apex attenuated and acute; suture crenulated; whirls eleven, convex, the last about one-fourth the length of the shell, rounded, subangulate at base; aperture sub-

Fig. 376.



Macroceramus gossei.

circular; peristome briefly expanded, with approaching termini, the columellar expansively reflected. Length 11, diam. 3⅔; aperture 3⅓ mill. long, 3¼ broad.

Bulimus gossei, PFEIFFER, Proc. Zool. Soc. 1845, 137; Mon. Hel. Viv. II, 81; in Roemer's Texas, 456.—REEVE, &c. —W. G. BINNEY, Terr. Moll. IV, 135.

Cylindrella hydeana, *concisa*, &c., see PFEIFFER.

Macroceramus gossei, PFEIFFER, Mon. Hel. Viv. IV, 689.

Var. β. Somewhat smaller, the spots and blotches more obsolete.

From Jamaica, the variety from Texas.

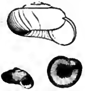
Little Sarazota Bay, near Charlotte Harbor, Florida.

PUNCTUM, MORSE.

Shell bearing the usual characters of *Hyalina* (see p. 29), from which it is generically separated by the nature of the jaw and lingual dentition (see Fig. 378).

Punctum minutissimum, LEA.—Shell umbilicated, subglobose, reddish horn-color, shining, marked with strong transverse striæ and microscopic revolving lines, both most prominent near the umbilicus; whirls four, convex, gradually increasing, the last broadly umbilicated; aperture subcircular, oblique; peristome simple, acute, its columellar extremity subreflected. Greater diam. 1½ mill., height 1.

Fig. 377.



Punctum minutissimum.

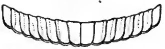
Helix minutissima, LEA, Trans. Am. Phil. Soc. IX, 17; Proc. II, 82 (1841); Obs. IV, 17 (1844); TROSCHEL, Arch. f. Nat. 1843, II, 124.—PFEIFFER, Mon. Hel. Viv. I, 87.—W. G. BINNEY, Terr. Moll. IV, 100, pl. lxxvii, f. 6, 7.—MORSE, Amer. Nat. I, 546, f. 45 (1867).

Helix minuscula, teste BINNEY, Terr. Moll. II, 221.

Punctum minutissimum, MORSE, Journ. Portl. Soc. I, 27, f. 69, 70, pl. viii, f. 71 (1864).

Conulus minutissima, TRYON, Am. Journ. Conch. II, 257, pl. iv, f. 63 (1866).

Fig. 378.



Jaw of *Punctum minutissimum*.[1] [MORSE.]

Maine, Massachusetts, New York, Ohio.

Jaw composed of sixteen

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[1] The character of the jaw would place the species in the subfamily

long slender corneous laminæ, recurved at their cutting edges, these plates partly lapping over each other.

Fig. 379.

Lingual dentition of *Punctum minutissimum*. [Morse.]

Lingual membrane with 51 arched rows of 13—1—13 teeth; plates long and narrow, becoming narrower as they approach the sides of the membrane; plates transparent, denticles light horn-color, central plate largest with one small denticle, laterals with two equally short rounded denticles, those on the verge of the membrane having three minute denticles.

Subfamily PUPINÆ.

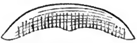
Jaw small, slightly arcuate, with delicate perpendicular striæ, sometimes only visible on the margin; concave margin sometimes with a central projection.

Teeth of the lingual ribbon uniform, short, bicuspid or tricuspid.

CIONELLA, Jeffreys.

Shell oblong-acuminate or ovate-oblong, striated or smooth, shining; whirls 6–7, the last rounded; aperture oval, equalling about one-half to one-third the shell's length; columella short, arcuate, more or less truncated, peristome straight, often thickened.

Fig. 380.



Jaw of *Cionella subcylindrica*.

Jaw slightly arched, slender, furrowed with delicate, vertical striæ, its concave margin scarcely denticulated.

Lingual teeth arranged in transverse series, central tricuspid, laterals bicuspid, uncini serrated.

Orthalicinæ, as a distinct genus, for which Mr. Morse's name *Punctum* might be retained; otherwise the species would be placed in *Hyalina*.

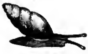
Fig. 381.

Lingual teeth of *Cionella subcylindrica.*

Subgenus **ZUA**, Leach.

Shell ovate-oblong, imperforate, smooth, pellucid, glistening, dark horn-colored; whirls rather convex; aperture less than one-half the shell's length, ovate; columella more or less truncated; peristome blunt, its margins joined by callus.

Fig. 382.

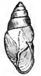


Animal of *Zua.*[1]

Animal short, stout, tail pointed; eye-peduncles long, stout, tentacles very short.

Cionella subcylindrica, Linn.—Shell small, thin, transparent, oblong-oval; epidermis smoky horn-color, smooth, very bright and shining; whirls five or six, somewhat rounded, the last equalling two-fifths the shell's length, rounded at base; apex obtuse; suture somewhat impressed; aperture lateral, oval, its plane nearly parallel with the axis of the shell; peristome simple, thickened, often slightly rufous; umbilicus imperforate; columella obsoletely truncated at base. Length 6, diam. 2½; aperture 2½ long, ½ mill. wide.

Fig. 383.



Cionella subcylindrica, enlarged.

Helix subcylindrica, Linn. Syst. ed. XII, II, 1248 (1767).—Not Mont.

Helix lubrica, Müller, Verm. Hist. I, 104 (1774).

Bulimus lubricus, Draparnaud, Moll. 75, pl. iv, 24.—Gould, Invertebrata, 193, f. 124 (1841).—Adams, Shells of Vermont, 157 (1842).—DeKay, N. Y. Moll. 55, pl. iii, f. 43 (1843).—Binney, Terr. Moll. II, 283, pl. iii, f. 4.

Achatina lubrica, Pfeiffer, Mon. Hel. Viv. II, 272.—W. G. Binney, Terr. Moll. IV, 138.

Zua lubrica, Leach, Moll. p. 114.—Gray, Man. 188.—Reeve, Brit. L. & Fr. W. Sh. 93 (1863).

Cionella lubrica, Jeffreys, Linn. Trans. XVI, 327.

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[1] *Zua subcylindrica*, from Reeve, very much enlarged.

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Bulimus lubricoides, STIMPSON, Sh. of N. E. 54.

Bulimus subcylindricus, MOQUIN-TANDON, Moll. Fr. II, 304, pl. xxii, f. 15–19.

Zua lubricoidea, MORSE, Journ. Portl. Soc. I, 30, f. 79, 81, 84; pl. x, f. 82 (1864); Amer. Nat. I, 607, f. 49 (1868).

From Canada to the Red River of the North, and English River. In Nebraska. In New England and the States bordering the great lakes.

Animal: Head, back, and eye-peduncles blue black, foot paler, shorter than the shell; tentacles short.

This little species, which is hardly larger than a grain of wheat, is certainly identical with the European shell. It is distributed over a vast expanse of country, and exists in immense numbers in certain favorable localities. Its usual place of abode is under leaves and the bark of decaying trees, in forests and groves. Its surface has a peculiarly brilliant reflection, which excels that of any other of our shells; and hence it has been known in France as "la brillante." There is a slight sinuosity at the union of the peristome with the columella, rendering the aperture a little effuse at this point, and approximating the shell to the genus *Achatina*. This, and its other departures from the typical *Bulimuli*, have caused it, in several instances, to receive a generic distinction. Dr. Leach first indicated it as a separate genus, under the name *Zua*.

This is one of the circumpolar species common to Europe, Asia, and America. On this continent it is not found farther south than the Middle States. In Europe it is found in Spain, Italy, and Illyria, as well as the extreme northern countries. Pfeiffer also quotes it from Madeira.

Its identity with the species of the old world has been doubted, and the specific name *lubricoides* applied to it.[1] I have no doubt of its being the same species, being unable to detect any differences between American and foreign individuals. In criticizing the plates of the Terrestrial Mollusks, Dr. Pfeiffer notices considerable difference between the figure there given and the European shells (Mal. Blatt. 1858, 28).

Moquin-Tandon (II, 305) describes the jaw as low, slightly arched, light horn-colored, extremities attenuated, somewhat pointed, vertical striæ very fine, scarcely any denticles on the concave margin. Morse describes the jaw of specimens from Maine as slightly arcuate, tapering to a point laterally; anterior surface with conspicuous longitudinal striæ; the middle of the concave margin produced into an obtuse beak.

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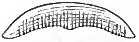
[1] This is preoccupied.

Fig. 384.

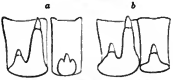


Jaw of *Cionella subcylindrica*. [MORSE.]

On p. 224 I have given a figure of the lingual membrane of a Maine specimen. There are 90 rows of 43 teeth (21—1—21); central plate long, very narrow, with a minute central tooth, with traces of a denticle at each side of its base; laterals square, bicuspid, first cusp wide and strong, as long as plate, second cusp short, obtuse; first seven uncini tridentate, inner denticle prominent; the rest short wide plates, denticulated, two extreme uncini plain.

Fig. 385 *a* gives an enlarged view of the central and first lateral teeth of an American specimen, which may be compared with the fac-simile (Fig. 385 *b*) of the same, of Thomson (Annals Nat. Hist. VII), from an English specimen. The differences between the central teeth are certainly very great, but of what value in determining specific distinction I am not prepared to say.

Fig. 385.



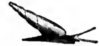
Teeth of *Cionella subcylindrica*. [MORSE.]

Cat. No.	No. of Sp.	Locality.	From whom received	Remarks.
8431	1	Milwaukee, Wis.	I. A. Lapham.	......
8432	22	Kansas.	......	......
8433	20	Maine.	Dr. J. Lewis.	......
8434	29	Mohawk, N. Y.	"	......
8435	2	Massachusetts.	W. Stimpson.	......
8655	15	"	W. G. Binney.	Cab. series.
8796	20+	"	W. Stimpson.	......
9083	1	English River.	R. Kennicott.	......

SUBGENUS ACICULA, (Leach,) Risso.

Shell elongate, imperforate, polished, vitreous, white, apex rather obtuse; aperture equalling about one-half the shell's length, oblong; columella subarcuate, distinctly truncated, peristome simple, acute. No eyes.

Fig. 386.

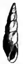


Animal of *Acicula*.[1]

Animal short, slender, tail acutely pointed, eye-peduncles very long, slender, tentacles short, stout.

Cionella acicula, MULL.—Shell cylindrically fusiform, needle-like, attenuated towards the obtuse apex, glassy, polished, white; suture narrowly margined; whirls six to seven, flattened, the last equalling two-fifths of the shell's length; columella arcuate, narrowly and abruptly truncated at its base; aperture narrow, lanceolate; peristome simple, straight, acute. Length 4⅔, diam. 1¼; of aperture, length 2, breadth ¾ mill.

Fig. 387.



Cionella acicula, enlarged.

Buccinum acicula, MULLER, Verm. Hist. II, 150 (1774).
Bulimus acicula, BRUGUIERE, &c., MOQUIN-TANDON, Moll. Fr. II, 309, pl. xxii, f. 32, 34.
Achatina acicula, LAMARCK, &c., PFEIFFER, Mon. Hel. Viv. II, 274.—REEVE, Brit. Land and Fr.-Water Shells, 97, fig.
Buccinum terrestre, MONTAGU, &c. &c. For further syn. see PFEIFFER.

The shell figured is from Florida (*Bartlett!* in coll. A. Binney). It agrees well with English specimens, so that I have no doubt of its being the species to which I have referred it. It is not like *A. iota*, of Jamaica, or *A. gundlachi* of Cuba.

Pfeiffer gives Europe and Madeira as the habitat of *A. acicula*. It is said by Moquin-Tandon to live in the crevices of rocks and under moss and dead leaves.

Specimens have lately been found at Princeton, N. J., doubtless imported on plants.

STENOGYRA, SHUTTL.

Shell turreted, sometimes truncated, hyaline or white, with a delicate horn-colored, sometimes reddish epidermis; whirls straight, numerous, 7–18 in number, gradually enlarging; apex obtuse; aperture semi-oval or ovate-oblong; peristome straight, generally simple; columella usually truncated.

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[1] From Reeve: *C. acicula*, very much enlarged.

Fig. 388.

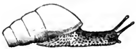
Jaw of *Stenogyra decollata.* [Moq.-Tand.]

Jaw arcuate, delicately striated and denticulate. Middle lingual teeth very small.

SUBGENUS **RUMINA**, Risso.

Shell obsoletely rimate, calcareous, normally truncated, cylindrically-elongate; remaining whirls 4–6, the upper truncated ones 8–10, the upper one globular; aperture semioval; peristome straight, thickened within, its margins connected with callus, the columellar twice as short as the external one; columella not truncated.

Fig. 389.

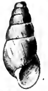


Animal of *Stenogyra decollata.*

Animal short, stout, surface finely granulated; tail short, rather bluntly terminating; eye-peduncles long, slender, tentacles very short.

Stenogyra decollata, LINN.—Shell rather thick, long, cylindrical, turreted; epidermis shining, whitish, with a slight tint of brownish or yellowish; apex obtuse; spire gradually enlarging from the apex to the aperture, commonly abruptly truncated between the third and fifth whirls next the aperture; whirls remaining three to five, flat, a little wrinkled, and in the last two or three slightly crenate, or plaited below the suture; suture not impressed; aperture lateral, oval, angulated superiorly, its plane very nearly parallel with the axis of the shell; peristome simple, thickened within, its columellar portion reflected. Axis of the truncated shell usually about 25 mill., diameter of the largest whirl less than 12 mill.

Fig. 390.



Stenogyra decollata.

Helix decollata, LINNÆUS, Syst. Nat. 1247, &c.

Bulimus decollatus, DRAPARNAUD, 76, pl. iv, f. 27, &c.—PFEIFFER, Mon. Hel. Viv. IV, 456.—BINNEY, Terr. Moll. II, 280, pl. 1, f. 1.—W. G. BINNEY, Terr. Moll. IV, 131.—LEIDY, T. M. U. S. I, 259, pl. xv, f. 5, 6 (1851), anat.

Bulimus multilatus, SAY, Journ. Acad. Nat. Sci. Philad. II, 373; ed. BINNEY, 25 (err. typ. for *mutilatus*).

Bulimus mutilatus, DeKay, N. Y. Moll. 56 (1843).—Pfeiffer, Mon. Hel. Viv. II, 153; III, 397.—Reeve, Con. Icon. f. 231.

An European species, introduced at Charleston, S. C., where it has increased very rapidly, and has retained its position for more than fifty years

Animal (see Fig. 389): Body short, extending but little behind the aperture, blackish, or bluish-black on the head and back, with decidedly green reflections in certain lights, the sides and posterior extremity olivaceous; surface finely granulated; eye-peduncles slender and rather short; ocular points very small; tentacles very short. The shell is carried nearly horizontally when in motion. It is very voracious in its habits. I kept a number of individuals received from Charleston a long time as scavengers, to clean the shells of other snails. As soon as a living *Helix* was placed in the box with them, one would attack it, introduce itself into the inner whirls, and completely remove the animal. Leaving a number of *Succinea ovalis*, Gld., with them one day, they disappeared entirely in a short time. The *Stenogyra* had eaten shell as well as animal.[1]

The young shell is thin, transparent, and fragile; the old is opaque and rather thick. It is very peculiar in respect to the manner of breaking off and abandoning successive portions of the spire. According to the plan upon which the shell is projected, it would, when it reaches the full size which it attains in this country, possess ten or more full volutions, if it retained all of them from the apex downward. But as fast as the growth of the animal compels it to increase the number and volume of the whirls, it releases its connection with the superior whirls, creates a new attachment lower down, forms a new apex or spiral calcareous septum, which separates it from the abandoned part; and, in some manner which is not understood, breaks and throws off those whirls which are no longer of use.[2] This commences at a very early period; the original apex being thrown off when the shell has acquired five or six whirls. They differ,

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[1] I find no notice of any such carnivorous habits mentioned by Moquin-Tandon. It may be the species prefers vegetable food, but being deprived of that was forced by hunger to devour animal food.

[2] Moquin-Tandon says (on the authority of Gassies) that the animal breaks off the upper whirls by jerking round its shell against some hard object.

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in this particular, from most of land shells, and especially from the *Helices*, which always, so far as I know, retain their original attachment to the apex of the shell. It has been thought that the breaking of the spire, after being left by the animal, and becoming dry and brittle, is accidental; but I conceive that the effect is much too constant to be accounted for in that way. I have never been able to find a mature specimen with the apex. And in all the various countries which it inhabits, including the whole southern part of Europe, the northern part of Africa, the islands of the Mediterranean, the Canaries, Madeira, &c., the same peculiarity attends it. If it were only an accident, some few in this wide extent might escape. I doubt not, therefore, that it is effected by the action of the animal itself. It may be that the calcareous matter of the shell is absorbed at the point of division, previous to the formation of the new septum.

Mr. Say made out his description from an immature specimen.

Fig. 391.

Jaw of *Stenogyra decollata*. [Moq.-Tand.]

Moquin-Tandon describes the jaw as low, somewhat curved from front backwards, of a tawny orange color, extremities attenuated, generally somewhat pointed; the concave margin forming an elliptical arch with a slight projection towards the middle; vertical striæ very delicate; marginal denticles scarcely perceptible.

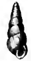
Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8704	4	Charleston, S. C.	W. O. Binney.	Cab. series.

SUBGENUS **OPEAS**, Albers.

Shell minutely perforated or rimate, thin, striated, slightly or moderately smooth; whirls 6–8, rather convex, the last usually compressed; aperture ovate-oblong, equalling one-third to one-fourth of the shell's length; peristome simple, acute, its columellar margin reflected. Size moderate or small.

Stenogyra subula, PFR.—Shell small, elongated, turreted, transparent, with delicate, longitudinal striæ, sometimes of a spermaceti white, and sometimes wax-yellow; whirls about eight, convexly rounded, revolving more closely at apex than elsewhere, so as to form a somewhat obtuse summit, the last whirl less than one-third the length of the shell; suture deeply impressed; columella nearly straight; aperture elongated, narrow, rhomboid-elliptical; peristome simple, its right margin straight, its columellar margin slightly reflexed, protecting a minute umbilical perforation. Length of axis 13 mill., diameter about 3 mill.

Fig. 392.



Stenogyra subula.

Achatina subula, Pfeiffer, Wiegm. Archiv. 1839, I, 352.
Bulimus subula, Pfeiffer, Symbolæ, I, 85; Mon. Hel. Viv. II, 158.—Binney, Terr. Moll. II, 285, pl. liii, f. 4.—W. G. Binney, Terr. Moll. IV, 134.—Reeve, Con. Icon. f. 494.
Bulimus octonoides, D'Orbigny, Moll. Cub. I, 177, tab. xi, f. 23, 24; pl. xi *bis*, f. 22–24.
Bulimus procerus, Adams, Proc. Bost. Soc. Nat. Hist. II, 13.
Bulimus hortensis, Adams, *vid.* Contr. to Conch. p. 221.

Found at Ft. Dallas, Florida (*Cooper*), and in several of the West India Islands, Cuba, St. Thomas, Jamaica, Porto Rico. Also at Chiapa, Mexico (*Pfeiffer*).

This species belongs to a somewhat numerous group found in the tropics, wherever the banana and other *Musaceæ* flourish; some of which have the columella truncated, and were formerly arranged under the genus *Achatina*, like *S. octona*, though by their natural affinities they are clearly associated. The banana and plantain have, by transplantation, become naturalized throughout the tropics; and it is highly probable that many shells found with them, which have received different names merely because they have been found in localities far remote from each other, are really identical. This shell is considerably smaller and more rapidly tapering than *S. octona*, which has its columella somewhat truncated, and has not as yet been found on this continent.

Cat. No.	No. of Sp.	Locality.	From whom received	Remarks.
8710	7	Florida.	W. O. Binney.	Cab. series.

Subgenus **MELANIELLA**, Pfr.

Shell imperforate, ribbed, usually decussated, sculptured, brownish horn-colored, rather solid; whirls 9 rather convex, graduated, the three or four upper ones without ribs; aperture effuse at base, ovate; columella constricted; peristome simple, subcontinuous.

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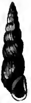
Stenogyra gracillima, Pfr.—Shell imperforate, minute, elongated, very slender, thin, of a drab-white color, ornamented with elevated, compressed, sharp, rather distant, longitudinal ribs, of which there are from twenty to thirty on each whirl, the interstices sculptured by very crowded lines; spire obtuse at the apex, and composed of about eight flattish whirls, the last of which is about one-fourth the length of the shell, and somewhat angular below the middle; suture deeply impressed; aperture small, elongated, rhomboidal-ovate; peristome sharp, and somewhat pressed inward, so as to be parallel to the axis; the columella is straight, and joins the peristome at an angle, so as almost to form a notch at the base of the aperture. Length 7, diam. 1¾; aperture 2 mill. long, 1 wide.

Fig. 393.



Stenogyra gracillima, magnified 4 times.

Achatina gracillima, Pfeiffer in Wiegm Arch. 1839, I, 352. —Binney, Terr. Moll. II, 293, pl. LIII, f. 3.

Bulimus gracillimus, Pfeiffer, Symb. III, 54; Mon. Hel. Viv. II, 160.—Reeve, Con. Icon. 594.—W. G. Binney, Terr. Moll. IV, 134.

Achatina striato-costata, D'Orbigny, Moll. Cub. I, 176, pl. xi, f. 19–21?

Cuba, St. Thomas, and Florida; also Bahamas.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8709	2	Florida.	W. G. Binney.	Cab. series.

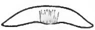
Spurious Species of Stenogyra.

Stenogyra (Subulina) octona, Chemnitz, has been found in greenhouses, having been introduced on plants.

PUPA, Dr.

Shell cylindrical, ovate or buliform, rimate or perforate; last whirl proportionally small; aperture semioval or subrotund, generally furnished with entering, fold-like denticles; peristome expanded or subsimple, margins equal, subparallel, distant, usually connected with a callous lamina.

Fig. 394.

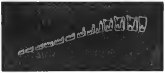


Jaw of *Pupa corticaria*. [Morse.]

Jaw somewhat arcuate, furrowed with delicate striæ, its concave edge unbroken, generally somewhat prominent in the middle.

Lingual band narrow, central teeth tricuspid, laterals bicuspid, uncini serrated.

Fig. 395.



Lingual dentition of *Pupa corticaria*. [Morse.]

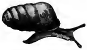
Most of the species are so small that it requires much care and no little skill to find them. Some are found in forests, under decaying leaves, or fragments of dead branches, lying on the ground, or in the crevices of bark, or about decaying stumps and logs; some are found in plats of moss, others under stones, sticks, etc., in the open fields; and many at the margins of brooks, pools, and ponds, under chips, or crawling up the stems of plants, and seem to be incapable of existing unless abundantly supplied with moisture, seeming to be aquatic rather than terrestrial in their habits. They feed on decaying vegetable matter, keeping themselves in the shade, and adhering closely to the objects on which they rest when in repose. In the winter they bury themselves under the leaves or in the earth.

Subgenus **PUPILLA**, Leach.

Shell deeply rimate or perforate, cylindrically shortened, apex extended into an obtuse cone; horn-colored, smooth; whirls 5–9; aperture rounded with few or no folds; peristome somewhat expanded.

Animal small, short, tail short, pointed; eye-peduncles long, tentacles stout, very short.

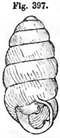
Fig. 396.



Animal of *Pupa muscorum*. [Reeve.]

Pupa muscorum, Lin.—Shell perforate, cylindrical, subfusiform, obtuse at both extremities; epidermis dark chestnut-color, or bay; whirls six to seven, rounded, the anterior four of about equal diameter; suture deep; aperture lateral, nearly circular, small, its diameter equal to two-thirds of the diameter of the last whirl, a thin, testaceous deposit forming a thickened margin internally, sometimes bearing an obtuse tubercle; upon the parietal wall is a single tubercle; transverse margin subreflected; lip slightly reflected. Length 4, breadth 1½ mill.

Fig. 397.



Pupa muscorum, enlarged.

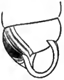
Pupa badia, Adams, Bost. Journ Nat. Hist. III, 331, pl. iii, f. 18; Shells of Vermont, 157.—Gould, Bost. Journ. Nat. Hist. III, 404; IV, 360.—DeKay, N. Y. Moll. 49, pl. iv, f. 45.—Chemnitz, ed. 2, 117, pl. xv, f. 25–29.—Binney, Terr. Moll. 323, pl. lxx, f. 3. —W. G. Binney, Terr. Moll. IV, 142.

Pupa muscorum, Linnæus, part, Pfeiffer, Mon. Hel. Viv. IV, 666, &c.

Pupilla badia, Morse, Journ. Portl. Soc. I, 37, f. 89, 91, pl. x, f. 92 (1864); Amer. Nat. I, 609, f. 52 (1868).

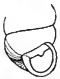
Found in the islands in the Gulf of St. Lawrence, and in Maine, Vermont, and New-York. Its range in Europe is very great, being found from Siberia to Sicily, England, Iceland, &c.

Fig. 398.



Pupa badia. [Morse.]

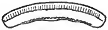
Fig. 399.



Pupa muscorum. [Morse.]

The shell is often met with an edentulate aperture. Such is the specimen figured in the second edition of Chemnitz, and my figure (Fig. 398), drawn from a Maine specimen. Fig. 399 is drawn from an European individual of *P. muscorum.*

Fig. 400.



Jaw of *Pupa badia.* [Morse.]

Jaw of American specimen slightly arched, concave edge waving.

The lingual membrane has 90 rows of 29 teeth each (14—1—14). Central teeth small, tricuspid, the laterals bicuspid, uncini serrated.

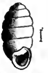
Fig. 401.

Lingual dentition of *Pupa badia.* [Morse.]

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
5410	1	Yellowstone.	......	......
8411	3	New York.	Dr. J. Lewis.	......
8697	11	Maine.	W. G. Binney.	Cab. series.

Pupa blandi, Morse.—Shell rimate, ovate cylindrical, delicately striated, opaque, light brown; apex obtuse, nucleus with microscopic granulations; suture well defined; whirls six, subconvex, the last ascending at the aperture, rapidly expanding, with an external whitish callus, between which and the peristome there is a deep constriction; aperture small, nearly circular, with three obtuse teeth of about equal size, one on the parietal margin, one on the columellar margin, and the third far within and at the base of aperture; peristome subreflected, the margins joined by a thin callus. Length .13 inch, breadth .06 inch. (*Morse.*)

Fig. 402.



Pupa blandi.

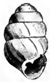
Pupilla blandi, Morse, Ann. N. Y. Lyc. VIII, 211, f. 8 (Nov. 1865).

Pupa blandi, W. G. Binney, Expl. in Nebraska, Ex. Doc. 25th Congress, 2d Sess. II, part 2, p. 725 (1859), no descr.

In drift on Missouri River, near Ft. Berthold.

Pupa hoppii, Möller.—Shell subperforate, cylindrically ovate, thin, very delicately striated, horn-colored, shining, pellucid; spire terminating in an obtuse cone; whirls five, rather convex, the last scarcely equalling two-fifths the shell's length, ascending above, somewhat narrowed towards the base; columella deeply subplicate, parietal wall of the aperture furnished with one tooth-like callus; aperture vertical, subsemicircular; peristome thin, scarcely expanded, its right termination quite arched. Length 2¾, diam. 1 mill.

Fig. 403.



Pupa hoppii.

Pupa hoppii, Möller, Ind. Moll. Gr. 4 (1842).—Troschel, Arch. f. Nat. 1843, II, 126.—Chemnitz, ed. 2, 163, pl. xix, f. 29, 30.—Pfeiffer, Mon. Hel. Viv. II, 328; III, 536; IV, 666.—W. G. Binney, Ter. Moll. IV, 147, pl. lxxviii, f. 20.

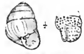
Pupa steenbuchii, Beck, teste Mörch, Nat. Bidrag af Gr. 75.

Inhabits Greenland, and has also been found at Anticosti Island.

The description given above is translated from Pfeiffer. The specimen figured, which I refer to this species, has another denticle on the columella, and a lamina-like process within the aperture at the base of the last whirl.

Pupa variolosa, Gould.—Shell minute, ovate-conical, with a pointed apex, of a yellowish-green color, apparently smooth, but when examined by a considerable magnifying power, is found to be thickly pitted with dots of unequal size and irregularly disposed; there are four or five narrow, tumid whirls, separated by a profound suture; the aperture is obliquely semioval, and has a posterior lamellar tooth winding within the shell, a tooth on the columella, and another a little to the right of the basal apex; a small umbilical opening is covered by the reflected columellar margin of the peristome, and the other margin is slightly everted. Length 2 mill., diam. 1.

Fig. 404.



Pupa variolosa.

Pupa variolosa, Gould, Proc. Bost. Soc. Nat. Hist. III, 40: Terr. Moll. II, 331, pl. lxxii, f. 3.—Pfeiffer, Mon. Hel. Viv. III, 556.—W. G. Binney, Terr. Moll. IV, 146.

East Florida.

Pupa pentodon, Say.—Shell subperforate, of an elongated ovate form, minutely striated, and of a spermaceti, or whitish horn-color; whirls about five, well rounded, and separated by a deep suture; apex rather acute; aperture oblique, nearly semicircular; peristome sharp, and somewhat expanded, but not reflexed; the submargin of the throat is thickened by a ridge of white callus, on which the denticles are situated; one of these, and sometimes two, is on the parietal wall, two on the columellar portion of the peristome, and two constantly, and from one to five others occasionally, on the other portion of the peristome; of these, that near the middle of the parietal wall is largest, that at the upper part of the columellar is next, and one opposite the first, on base of the aperture, is the third in size. Length 2, diam. 1; of aperture, length ⅔ mill.

Fig. 405.

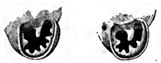
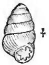


Fig. 406.



Pupa pentodon.

Vertigo pentodon, Say, Journ. Acad. Nat. Sci. Phila. II, 376 (1822); ed. Binney, 27.

Pupa pentodon, Gould, Bost. Journ. Nat. Hist. IV, 353, pl. xvi, f. 10, 11

(1843).—DeKay, N. Y. Moll. 50, pl. iv, f. 48; pl. xxxv, f. 337 (1843).—Pfeiffer, Mon. Hel. Viv. II, 359; in Chemnitz, ed. 2, 125, pl. xvi, f. 24-26.—Binney, Terr. Moll, II, 328, pl. lxxii, f. 1.—W. G. Binney, Terr. Moll. IV, 143.

Pupa curvidens, Gould, Invertebrata, 189, f. 120 (1841).

Pupa tappaniana, Adams, Silliman's Journ. [1], XL, Suppl.; Shells of Vermont, 158 (1842).—Pfeiffer, Symbolæ, II, 55.

Leucochila pentodon, Morse, Journ. Portl. Soc. I, 36, f. 85; pl. x, f. 86 (1864); Amer. Nat. 667, f. 56 (1868).

From Georgia and Mississippi to the most northern portions of the Union. It is usually found at the foot of trees and under leaves.

Animal blackish above, light gray below; foot moderately long, the transverse fissure very distinct, the anterior portion having the mouth in the centre, and bilobate in front. Tentacles about one-third as long as the eye-peduncles. Very sluggish in its movements, and carries the shell nearly horizontally, or very slightly elevated.

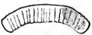
Fig. 407.

Animal of *Pupa pentodon*.

An enlarged view of the aperture is given in Fig. 405.

Jaw slightly arcuate, of uniform breadth, anterior surface longitudinally striate, concave margin minutely notched.

Fig. 408.



Jaw of *Pupa pentodon*. [Morse.]

Lingual membrane with 64 rows of 21 (10—1—10) teeth; centrals with three subequal, very small cusps; laterals bicuspid, uncini serrate, the inner point much developed.

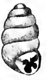
Fig. 409.

Lingual dentition of *Pupa pentodon*.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8707	3	....	W. G. Binney.	Cab. series.
8797	20+	Massachusetts.	W. Stimpson.	......

Pupa decora, Gould.—Shell minute, cylindrical, rounded at apex, thin, shining, translucent, of a wine-yellow color, regularly striated by lines of growth; spire of five or six closely revolving, rounded whirls, deeply separated at the sutures; aperture nearly round or semioval, obliquely limited by the penultimate whirl, armed with four slender denticles, the largest of them on the parietal wall, one on the columellar

Fig. 410.



Pupa decora, enlarged.

portion of the peristome, and two on the outer portion, all disposed so as to form the arms of a cross; the peristome is slightly reflexed, and indented opposite the base of the two labial denticles; at the columella, it rises against a distinct umbilical perforation. Length 2½, diam. 1¼ mill.

> *Pupa decora*, GOULD, Proc. Bost. Soc. Nat. Hist. II, 263 (Dec. 1847), with a woodcut; in Terr. Moll. II, 327, pl. lxxi, f. 2.—PFEIFFER, Mon. Hel. Viv. III, 555.—W. G. BINNEY, Terr. Moll. IV, 143.

Near Lake Superior. Fort Resolution, Great Slave Lake (*Kennicott.*)

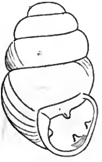
Cat. No.	No. of Sp	Locality.	From whom received.	Remarks.
9079	6	British America.	Kennicott.	......

Pupa corpulenta, MORSE.—Shell rimate perforate, elongate ovate, finely striated, polished, translucent, dark olive brown; apex round, obtuse; whirls four, convex, tumid, wider at the base; aperture large, subcircular, with four obtuse teeth, one on the parietal margin, one on the columellar margin, and two on the labrum; peristome slightly thickened and reflected. Length .10 inch, breadth .06 inch. (*Morse.*)

> *Isthmia corpulenta*, MORSE, Ann. N. Y. Lyc. VIII, 210, f. 7 (Nov. 1865).

Little Valley, Washoe Co., Nevada; on east slope of Sierra Nevada, 6500 feet above the sea.

Fig. 411.

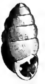


Pupa corpulenta.

Pupa rowellii, NEWCOMB.—Shell perforate, oblong-ovate, dark horn-colored, shining, translucent, finely striated; apex obtuse; whirls five, convex; aperture truncately ovate, armed with four teeth, one prominent and plicate on the columella, three deeply seated within the aperture, one on the columella, two within the peristome; peristome slightly reflected. Length 2, breadth 1 mill.

> *Pupa rowellii*, NEWCOMB, Ann. N. Y. Lyc. VII, 146.—BLAND, Ann. N. Y. Lyc. VIII, 166, f. 11 (1865).

Fig. 412.

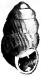


Pupa rowellii.

Near Oakland, California.

Pupa californica, Rowell.—Shell rimately subperforate, elongate ovate, thin, dark horn-colored; with oblique rib-like striæ; apex obtuse; deep suture; with five to six convex whirls, the last a little compressed at the aperture; aperture oblique, suborbicular, armed with four white denticles; one lamelliform, strongly developed, slightly twisted, on the parietal wall, one on the columella, and two deeply seated within or near the base of the aperture; peristome slightly expanded, columellar margin somewhat reflected. Long. 2½, diam. 1 mill.

Fig. 413.



Pupa californica.

Pupa californica, Newcomb, Ann. N. Y. Lyc. VII, 287.—Bland, Ann. N. Y. Lyc. VIII, 166, f. 12 (1865).

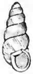
San Francisco, California.

Subgenus **LEUCOCHILA**, Alb. & Mart.

Shell rimate, cylindrically ovate, apex rather obtuse; rather smooth, shining, pellucid; whirls 6–7, rather convex, aperture semioval, edentulate or narrowed by folds, among which the parietal is the strongest; peristome thickened, reflected, its external margin decidedly arcuate. Tentacles very distinct.

Pupa fallax, Say.—Shell fusiform, regularly diminishing in volume from the body-whirl to the apex, smooth; epidermis brownish horn-color; whirls six, very convex, striæ of growth hardly apparent; suture well impressed; aperture lateral, rounded oval; peristome white, rather broadly reflected, lined within with white callus, its right termination strongly curved; umbilicus perforated. Length 5½, diam. 2–2½; aperture 1⅔ mill long.

Fig. 414.



Pupa fallax, enlarged.

Cyclostoma marginata, Say, Journ. Acad. Nat. Sci. Phila. II, 172 (1821); Binney's ed. 22.

Bulimus marginatus, Pfeiffer, Mal. Blatt. II, 94; Mon. Hel. Viv. IV, 414.—W. G. Binney, Terr. Moll. IV, 136.

Bulimus fallax, Gould, in Terr. Moll. II, 288, pl. lii, f. I.

Pupa fallax, Say, Journ. Acad. Nat. Sci. Philad. V, 121 (1825); Binney's ed. 28.—Gould, Invertebrata, 192, f. 123 (1841), excl. syn. *placida*; Bost. Journ. Nat. Hist. IV, 357, pl. xvi, f. 15 (1843).—DeKay, N. Y. Moll. 51, pl. xxxv, f. 331 (1843).—Pfeiffer, Mon. Hel. Viv. II, 309; III, 333; in Chemnitz, ed. 2, 58, pl. xii, f. 20, 21 (1844).

Pupa parraiana, D'Orbigny, Moll. Cuba, 181, pl. xii, f. 9–11 (1853).

Pupa albilabris, Adams, Vermont Mollusca, p. 158 (1842); Silliman's Journ. [I], XL, 271.

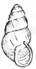
Pupilla fallax, MORSE, Amer. Nat. 609, f. 53 (1868).
Paludina turrita, MENKE? Syn. Meth. 40.

From Nebraska to Texas and From New England to South Carolina. In several of the West India Islands.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8422	6	Washington, D. C.	W. Stimpson.	......
8423	2	Kansas.	......	......
8424	3	Milwaukee, Wis.	I. A. Lapham.	......
8501	5	....	W. O. Binney.	Cab. series.

Pupa modica, GOULD.—Shell small, delicate, elongated, ovate-conic, whitish or pale horn-colored, imperforate; whirls five, convex, the apex of the spire acute; aperture expanded, peristome revolute, but not flattened, its right-margin strongly curved above; throat destitute of teeth. Length 2½, diam. 1⅓ mill.

Fig. 415.



Pupa modica, enlarged.

Pupa modica, GOULD, Proc. Bost. Soc. Nat. Hist. III, 40 (1848); Terr. Moll. II, 318, pl. lii, f. 2.—W. G. BINNEY, Terr. Moll. IV, 142.—PFEIFFER, Mon. Hel. Viv. III, 533.
Bulimus modicus, PFEIFFER, Mon. Hel. Viv. IV, 414.

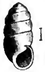
Georgia, Florida, and Alabama.

This species is very nearly allied, if not identical with *Pupa fallax*.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
5711	2	St. Simon's Isl., Ga.	W. G. Binney.	Cab. series.

Pupa arizonensis, GABB.—Shell rimate, oblong-fusiform, thin, delicately wrinkled, pellucid, horn-color; spire elongated, apex obtuse; whirls five, convex, the last equalling one-half the shell's length; aperture oblique, oval; peristome thickened, white, continuously slightly reflected, its ends approximating, joined by a light callus, that of the columella straight, dilated. Length 4½, diam. 2; aperture 1⅓ long, 1 mill. wide.

Fig. 416.



Pupa arizonensis.

Pupa (Modicella) arizonensis, GABB, Am. Journ. Conch. II, 331, pl. xxi, f. 6 (1866).

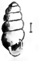
Arizona, at Fort Grant, junction of Arivapa and San Pedro Rivers.

The description and figure are drawn from an authentic specimen. The species is less elongated, more blunt, and has more convex whirls than *Pupa fallax*.

Pupa hordeacea, Gabb.—Shell rimate, cylindrical, thin, scarcely striate, pellucid, horn-color; spire elongated, apex obtuse; whirls five, convex, the last equalling one-third the shell's length; aperture truncate-ovate; peristome thickened, white, reflected, not continuous; one twisted, tooth-like, entering, prominent fold upon the parietal wall of the aperture, and one prominent upright tooth within the aperture at its base. Length 2½, diam. ¾ mill.

Pupa hordacea, Gabb, Am. Journ. Conch. II, 331, pl. xxi, f. 7 (1866).

Fig. 417.



Pupa hordeacea.

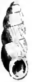
Arizona, at Fort Grant, junction of Arivapa and San Pedro Rivers.

My description and figure are drawn from an authentic specimen.

Pupa chordata, Pfeiffer.—Shell rimate, cylindrically oblong, thin, marked with oblique, somewhat separated cord-like ribs; pellucid, horn-colored; spire elongate, apex obtuse; whirls five and a half, moderately convex, the last hardly surpassing one-fourth the shell's length, rounded at the base; aperture oblique, oval; peristome thickened, white, slightly reflected in its whole length, its extremities approaching, the columellar slightly arched. Length 4, diam. 1 mill.; of the aperture scarcely 1 long.

Bulimus chordatus, Pfeiffer, Mal. Blatt. III, 46; Mon. Hel. Viv. IV, 420.

Fig. 418.



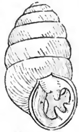
Pupa chordata, enlarged.

Mazatlan.

The specimen figured was received from Dr. Pfeiffer.

Pupa armifera, Say.—Shell cylindrical, subfusiform, smooth; whirls six to seven, convex, the three next the aperture of about equal diameter, the posterior three diminishing and forming a rather obtuse apex; suture impressed; peristome white, thin, subreflected, forming the whole outline of the aperture, except a small portion of the body-whirl, where a thin, testaceous deposit connects its two extremities; aperture lateral, nearly oval, deep, cup-shaped, and narrowing towards the throat, which is almost filled up by projecting teeth; white within; teeth commonly four, one of which, affixed to the body-whirl, commences at the superior margin of the aperture, near the junction of the peristome and ulti-

Fig. 419.



Pupa armifera, enlarged.

mate whirl, and runs backward and downward into the aperture, it is prominent, lamelliform, irregular, has one or more sharp, projecting points, and is sometimes bifid; another, thick and massive, is situated deep in the throat, and marks internally the place of the umbilicus; and two others, projecting and tooth-like, are placed on the peristome at the base of the aperture, and point towards the centre of the aperture; base of the shell, from the umbilicus to the edge of the aperture, compressed, forming a short and obtuse keel; umbilicus a little expanded, and slightly perforate. Length 4⅔ mill., diam. 2⅓; length of aperture 1⅔.

Pupa armifera, Say, Journ. Acad. Nat. Sci. Philad. II, 162 (1821); Binney's ed. 21.—Gould, Bost. Journ. Nat. Hist. III, 400, pl. iii, f. 10 (1840); IV, 359 (1843).—Adams, Vermont Mollusca, 157 (1842); Silliman's Journ. [1], XL, 271.—Pfeiffer, Symbolæ, II, 53; Mon. Hel. Viv. II, 357.—DeKay, N. Y. Moll. 52 (1843).—Binney, Terr. Moll. II, 320, pl. lxx, f. 4.—Küster, in Chemnitz, ed. 2, 57, pl. vii, f. 17–19.—W. G. Binney, Terr. Moll. IV, 142.
Pupa rupicola, Pfeiffer, Symbolæ, II, 55, teste Pfeiffer, in Mon.
Leucochila armifera, Morse, Amer. Nat. 667, f. 55 (1868).
Pupa armigera, Potiez et Michaud, Galerie, I, 159, pl. xvi, f. 1, 2.

Probably inhabits every State east of the Rocky Mountains.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8405	90	Kansas.	......	......
8406	8	Columbus, Ohio.	Dr. J. Lewis.	......
8407	9	Marietta, Ohio.	W. Holden.	......
8408	4	Milwaukee, Wis.	I. A. Lapham.	......
8409	50	Washington, D. C.	W. Stimpson.	......

Pupa contracta, Say.—Shell subconical; epidermis whitish horn-color; whirls between five and six, very convex, diminishing regularly from the last whirl, which is somewhat ventricose, to the apex; suture well impressed; peristome white, thickened, somewhat reflected, its extremities connected by a raised, testaceous fold, making the margin of the aperture entire; aperture lateral, rather triangular or trilobate, more than

Fig. 420.

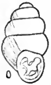
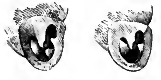


Fig. 421.



Pupa contracta, Say.

half as wide as the body-whirl, expanded above and diminishing regularly into a very narrow throat, with four teeth, one upon the columella, large, coarse, and irregular, projecting into and very much filling up the aperture, and having a concavity on the side towards the peristome; another tuberculous, not large, more or less near the margin of the peristome; and two others, massive and prominent, deep seated in the throat, one being in the base behind the columellar tooth, and the other on the side of the umbilicus and apparently produced by the umbilical fold; umbilicus with a minute perforation; base of the shell with a sharp keel between the umbilicus and margin; last whirl impressed behind the peristome. Length 3, diam. 1¾; of aperture, length 1 mill.

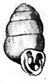
Pupa contracta, SAY, Journ. Acad. Nat. Sci. Philad. II, 374 (1822); BINNEY's ed. 25 (*Carychium?*).—GOULD, Bost. Journ. Nat. Hist. III, 399, pl. iii, f. 22 (1840); IV, 359 (1843); Invertebrata, 186, f. 117 (1841).—DEKAY, N. Y. Moll. 49, pl. iv, f. 47 (1843).—ADAMS, Vermont Mollusca, 157.—PFEIFFER, Symbolæ, II, 54; Mon. Hel. Viv. II, 356.—KÜSTER, in CHEMNITZ, 2d ed. 96, tab. xiii, f. 16–18.—BINNEY, Terr. Moll. II, 324, pl. lxx, f. 2.—W. G. BINNEY, T. M. IV, 143.

Pupa corticaria, PFEIFFER, Symbolæ, II, 54 (an var. β? PFEIFFER, *l. c.*).

Pupa deltostoma, CHARPENTIER, in CHEMNITZ, ed. 2, p. 181, pl. xxi, f. 17–19.—PFEIFFER, Mon. Hel. Viv. IV, 683.

Leucochila contracta, MORSE, Amer. Nat. 666, f. 54 (1868).

Fig. 422.



Pupa deltostoma.

Inhabits the whole of Eastern North America.

Fig. 422 is a fac-simile of the original figure of *Pupa deltostoma*, which appears identical with *P. contracta*.

Cat. No.	No. of Sp.	Locality.	From whom received	Remarks.
8412	33	Mohawk, N. Y.	Dr. J. Lewis.	......
8696	17	" "	"	Cab. series.

Pupa rupicola, SAY.—Shell cylindrical, elongated; epidermis brownish horn-color; whirls six, convex, the three anterior ones of nearly equal diameter, the three posterior diminishing very slightly, and forming an obtuse apex; suture deep; peristome brownish, thickened within, widely reflected; aperture lateral, semicircular, truncated above by the body-whirl; teeth five, one on the middle of the columella prominent, compressed, emarginate in the middle, and often bicuspid; another at the termination of the axis, marking internally the situation of the umbilicus, conical, and often composed of two or more tubercles; a third in the base of the aperture, a fourth upon the peristome, and a fifth, often massive

Fig. 423.

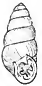
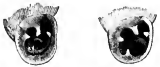


Fig. 424.



Pupa rupicola, enlarged.

and prominent, deep in the fauces behind the columellar tooth; umbilicus minute. Length 2½, diam. 1 mill.

Pupa rupicola, Say, Journ. Acad. Nat. Sci. Phila. II, 163 (1821); Binney's ed. 22 (*Carychium ?*).—Gould, Bost. Journ. Nat. Hist. IV, 355, pl. xvi, f. 13 (1843).—Pfeiffer, Mon. Hel. Viv. II, 358; III, 557, nec Symbolæ, II, 55; in Chemnitz, ed. 2, p. 123, pl. xvi, f. 17–19.—DeKay, N. Y. Moll. 52 (1843).—Binney, Terr. Moll. II, 341, pl. lxx, f. 1.—W. G. Binney, Terr. Moll. IV, 145.

Pupa procera, Gould, Bost. Journ. Nat. Hist. III, 401, pl. iii, f. 12 (1840).—Küster, in Chemnitz, 58, pl. vii, f. 20, 21.—Pfeiffer, Mon. Hel. Viv. II, 360.

Pupa carinata, Gould (olim), 1842, Bost. Journ. Nat. Hist. IV, 1, cover, p. 3; see also IV, 359 (1843).—Pfeiffer, Mon. Hel. Viv. II, 359; III, 557.

Pupa gibbosa, Küster, in Chemnitz, ed. 2, p. 123, pl. xvi, f. 13–16.

Pupa minuta (Say), Pfeiffer, Mon. Hel. Viv. II, 356; III, 555; Symb. II, 54.

Vertigo rupicola, Binney, *l. c.*

From Key West to Arkansas and New England.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8708	3	Baltimore, Md.	W. G. Binney.	Cab. series.

Pupa corticaria, Say.—Shell whitish, shining, cylindrical, obtuse at the apex; whirls rather more than five, convex; suture well impressed; aperture lateral, two-thirds as wide as the last whirl, suborbicular, with a single tooth (sometimes two) on the parietal wall, near the centre, and a tooth-like enlargement near the umbilical termination of the peristome, which is white, reflected; umbilicus very minutely perforated. Length 2½, diam. 1 mill.

Fig. 425.

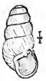
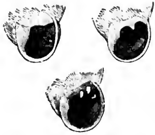


Fig. 426.



Pupa corticaria.

Odostomia corticaria, SAY, Nich. Encycl. IV, pl. iv, f. 5; ed. 1 (1817); ed. 2 (1818); BINNEY'S ed. 7, pl. lxxii, f. 5.

Pupa corticaria, SAY, Nich. Encycl. IV, ed. 3, 1819, pl. iv, f. 5.—GOULD, Bost. Journ. Nat. Hist. III, 397, pl. III, f. 19 (1840); IV, 358 (1843).—DEKAY, N. Y. Moll. 50, pl. iv, f. 49 (1843).—KÜSTER, in CHEMNITZ, 2d ed. p. 27, tab. xiii, f. 19–20.—PFEIFFER, Mon. Hel. Viv. II, 328.—BINNEY, Terr. Moll. II, 339, pl. lxxii, f. 4.—W. G. BINNEY, Terr. Moll. IV, 146.

Carychium corticaria, FERUSSAC, Prodr. no. 3 (no descr.).

Leucochila corticaria, MORSE, Journ. Portl. Soc. I, 36, f. 87; pl. x, f. 88 (1864).

From Maine and Wisconsin to South Carolina and Mississippi.

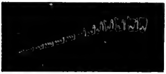
Fig. 427.

Jaw of *Pupa corticaria*. [MORSE.]

Jaw slightly arcuate, tapering towards the pointed ends, the centre of the anterior surface marked with longitudinal striæ; concave margin with a slight, broad, median projection.

Lingual membrane with ? rows of teeth, twenty-five (12—1—12) in each row. Central teeth very small, tricuspid, laterals bicuspid, modified into serrated uncini.

Fig. 428.

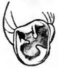


Lingual dentition of *Pupa corticaria*. [MORSE.]

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks
8413	1	Milwaukee, Wis.	I. A. Lapham.	......
8706	1	....	W. O. Binney.	Cab. series.

Pupa pellucida, Pfr. — Shell subperforate, cylindrical, thin, pellucid, shining, pale yellow, spire somewhat attenuated, apex obtuse; whirls five, convex, the last flatter than the penultimate; aperture semioval, with five teeth; single strong teeth on columella and parietal wall of aperture, two moderate ones on right side, a fifth small basal one within the aperture; peristome simple, its right end expanded, its columellar end reflected. Length 2, diam. scarcely 1 mill.; aperture scarcely ¾ mill. long.

Fig. 429.



Pupa pellucida.

Pupa pellucida, Pfeiffer, Symbolæ, I, 46 Mon. Hel. Viv. II, 360; in Römer's Texas, 456.—Küster, in Chemnitz, ed. 2, 89, pl. xii, f. 24, 25.—W. G. Binney, Terr. Moll. IV, 147.

Pupa servilis, Gould, Bost. Journ. Nat. Hist. IV, 356, pl. xvi, f. 14.—Pfeiffer, Mon. Hel. Viv. II, 360.

Pupa rüsei, Pfeiffer, olim, Mon. Hel. Viv. III, 532.—Küster, in Chemnitz, ed. 2, 176, pl. xxi, f. 13, 14.

A Cuban species quoted by Pfeiffer from Texas. I have seen no specimens of it. Fig. 429 is a fac-simile of that of *P. servilis*.

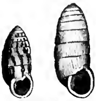
Subgenus STROPHIA, Albers.

Shell rimate, cylindrical or oblong-ovate, perpendicularly costulate or ribbed, solid, white, often variegated with red; whirls 9–12, the last narrowed towards the base, often ascending; aperture semioval, usually bluish-brown within; columella with a dentiform fold, parietal wall furnished with an internal denticle; peristome thickened, reflexed, its margins connected by a somewhat heavy callus.

Animal (of *P. incana*) whitish, brownish, smoky, or nearly black, darker on the back and upper part of head. Body finely granulated, the granules arranged in regular lines longitudinally, making the surface look as if minutely and longitudinally furrowed. Eye-peduncles rather short, slender, bulbous at the extremities, tentacles very short.

Pupa incana, Binney.—Shell deeply rimate, cylindrically-oblong, solid, smooth or delicately striate, shining, chalky; spire elongate, gradually attenuated into a rather acute cone; suture light, margined; whirls eleven, flat, very gradually increasing, the last scarcely equalling or shorter than the length, wrinkled anteriorly, more or less arcuately ascending, at base subcompressed; aperture small, roundly-lunate, light flesh color within, furnished with a moderate deeply seated parietal tooth and an obsolete columellar fold; peristome somewhat thickened, shortly reflected all round, its terminations joined by a thin callus, that of the columella dilated and arched above. Length 26, diam. 10; of aperture, length 8–9, diam. 7–8 mill.

Fig. 430.



Pupa incana.

A variety has irregular longitudinal streaks of reddish-brown.

Pupa incana, Binney, Terr. Moll. I, 109; III, pl. lxviii.—Leidy, T. M. U. S. I, pl. xv, f. 2–4, anat.—Pfeiffer, Mal. Blatt. II, 13; Mon. Hel. Viv. IV, 657.—W. G. Binney, Terr. Moll. IV, 140, pl. lxxix, f. 17.

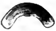
Pupa mumia, Potiez and Michaud, Gal. I, 169, pl. xvii, f. 1–2 (teste Pfr.).

Pupa maritima, γ, Pfeiffer, Mon. Hel. Viv. III, 539.—Gould, in Terr. Moll. II, 316.

Pupa detrita, Shuttleworth, MS., Pfeiffer, in Mal. Blatt. I, 158 (1853); I, 205 (1854), pl. iii, f. 9, 10.

A Cuban species found on the Florida Keys. It is found on saline plants a few inches from the soil on low grounds near salt-water ponds.

Fig. 431.

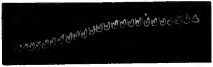


Jaw of *Pupa incana.*

The jaw (Fig. 431) is strongly arcuate, of uniform width, ends square; anterior surface striate; concave edge with a blunt median projection.[1]

Lingual membrane[2] with 129 rows of 49 teeth

Fig. 432.



Lingual dentition of *Pupa incana.*

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[1] The jaw figured was extracted by myself from a specimen in alcohol. That figured in Terr. Moll. I, pl. xv, f. 4, is quite different.

[2] The figure of the lingual dentition referred to this species in the second volume of the Terrestrial Mollusks represents that of *Macrocyclis concava.*

(24—1—24); central with a median cusp and two blunt obsolete cusps at its side; lateral teeth bicuspid; uncini serrate.

Some individuals have also internal denticles in the upper whirls (see Pfeiffer, Mal. Blatt. 1859, 209, pl. ii, f. 1–3).

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8414	4	Key Biscayne, Fla.	G. Wurdemann.	......
8695	3	" "	"	Cab. series.

Doubtful and Spurious Species of Pupa.

Pupa placida, Say, is probably an accidentally introduced specimen of *Buliminus obscurus*, Müller (see Boston Proc. I, 105). The original description here follows:—

> Shell dextral, cylindric-conic, pale yellowish horn-color; apex whitish, obtuse; whirls six and a half, somewhat wrinkled; suture moderately impressed; aperture unarmed, longitudinally oval, truncate a little obliquely above by the penultimate volution; columella so recurved as almost to conceal the umbilicus; labrum, with the exception of the superior portion, appearing a little recurved when viewed in front, but when viewed in profile, this recurvature is hardly perceptible; umbilicus very narrow.
>
> Length over three-tenths of an inch. Inhabits Massachusetts.
>
> For this shell I am indebted to Dr. T. W. Harris, of Milton, from whom I have received many interesting species of our more northern regions. At first view it might be mistaken for the *P. marginata*, Nob., but it is quadruple the size, and the labrum is not reflected and thickened. (*Say*.)

Pupa placida, Say, New Harmony Diss. II, 230 (1829); Descr. 24 (1840); Binney's ed. 39.—W. G. Binney, Terr. Moll. IV, 145
Pupa fallax, DeKay, N. Y. Moll. 51.—Gould, Invert. 192.
Pupa fallax, β, Pfeiffer, Mon. Hel. Viv. II, 309.
Bulimus hordeanus? DeKay, *l. c.*—Binney, Bost. Proc. I, 105.
Bulimus obscurus, Gould, Mon. Pupa, p. 17.—Pfeiffer, III, 350, on DeKay's authority.

Pupa costulata, Mighels, is the same as *Helix harpa*.
Pupa exigua, Say, &c., is the same as *Carychium exiguum*.
Pupa gouldii, Binney, &c., is the same as *Vertigo gouldii*.
Pupa milium, Gould, is the same as *Vertigo milium*.
Pupa modesta, Say, &c., is the same as *Vertigo ovata*.
Pupa ovata, Gould, &c., is the same as *Vertigo ovata*.
Pupa oculum, Pfeiffer, is the same as *Vertigo ovata*.
Pupa simplex, Gould, &c., is the same as *Vertigo simplex*.

Pupa unicarinata, Binney, Terr. Moll. I, is the same as *Macroceramus kieneri.*

Pupa nebrascana, of Warren's Report of Surveys, &c. Ex. Doc. II, pt. 2, 35th Cong. 1859, p. 725, may perhaps be *P. contracta.*

Fossil Species of Pupa.

Pupa helicoides, Meek & Hayden, Proc. Acad. Nat. Sci. Philad. VIII, 118.

Pupa vetusta, Dawson, Geol. Soc. Proc. 1852, IX, 60, pl. iv (*Dendropupa*, Owen).

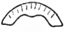
VERTIGO, Mull.

Shell deeply rimate, ovate, apex acuminate obtuse; whirls 5–6, the last rounded; aperture semioval, with four to seven folds; peristome scarcely expanded, white-lipped

Tentacles wanting.

Jaw smooth or with longitudinal wrinkles, subrostate.

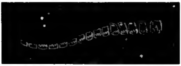
Fig. 433.



Jaw of *Vertigo ovata.* [Morse.]

Lingual membrane broad, central teeth tricuspid, laterals bicuspid or serrate, uncini serrate.

Fig. 434.



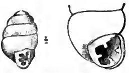
Lingual dentition of *Vertigo ovata.* [Morse.]

Subgenus ISTHMIA, Gray.

Shell dextral.

Vertigo gouldii, Binney.—Shell light chestnut, cylindrical ovate; whirls rather more than four, ventricose, the last occupying nearly one-half the length of the axis; aperture lateral, composed of two unequal curves meeting in the centre of the peristome, with five prominent, white teeth, namely, one upon the transverse margin, two upon the umbilical margin, and two upon the labial

Fig. 435.



Vertigo gouldii.

margin; peristome thickened, not reflected; umbilicus a little open. Length 2, diameter 1 mill.; aperture ⅔ long.

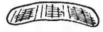
Pupa gouldii, Binney, Proc. Bost. Soc. Nat. Hist. I, 105 (1843); Terr. Moll. II, 332, pl. lxxi, f. 2.—Gould, Bost. Journ. Nat. Hist. IV, 352, pl. xvi, f. 9 (1843).—Pfeiffer, Mon. Hel. Viv. II, 358; Küster in Chemnitz, ed. 2, 124, pl. xvi, f. 20–23.

Vertigo gouldii, Stimpson, Shells of N. E. 53 (no descr.).—W. G. Binney, Terr. Moll. IV, 148.—Morse, Amer. Nat. 1, 669, f. 60 (1868).

Isthmia gouldii, Morse, Journ. Portl. Soc. I, 38, f. 95, pl. x, f. 96 (1864).

From Maryland through New England.

Fig. 436.



Jaw of *Vertigo gouldii*. [Morse.]

Jaw scarcely arcuate, of equal size throughout, ends rounded, anterior surface with longitudinal lines and transverse striæ; concave margin simple, no median projection.

Lingual membrane with 75 rows, each row containing 23 (11—1—11) short and stout teeth; centrals tricuspid; uncini serrated.

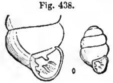
Fig. 437.

Lingual dentition of *Vertigo gouldii*. [Morse.]

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8413	50	Portland, Me.	Dr. J. Lewis.	Named by J. L.
8694	1	....	......	Cab. series
8798	11	Massachusetts.	W. Stimpson.	Named by W. S.

Vertigo bollesiana, Morse.—Shell minutely perforate, cylindrical ovate, delicately striated, subtranslucent; apex obtuse; suture well defined; whirls four, subconvex; aperture suborbicular, somewhat flattened on its outer edge; with five teeth, one prominent and rather curved on the parietal margin, two similar in form, the lower one the smaller, on the columellar margin, and two slightly elevated lamelliform teeth within and at the base; peristome subreflected and thickened. Length .065 inch; breadth .035 inch. (*Morse.*)

Fig. 438.



Vertigo bollesiana.

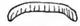
Isthmia bollesiana, Morse, Ann. N. Y. Lyc. VIII, 209, f. 4–6 (Nov. 1865).
Vertigo bollesiana, Morse, Amer. Nat. I, 669, f. 63–64 (1868).

New England; New York; Virginia.

Buccal plate of the same width throughout, slightly rounded at the ends; cutting edge without projections, finely striated.

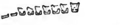
Lingual membrane with 88 rows of (12—1—12) teeth; central and lateral plates notched at outer posterior corners; central plate square, widening posteriorly, armed with three minute denticles, central one largest; laterals having two minute denticles apart, outer denticle nearly obsolete; uncini scarcely notched.

Fig. 439.



Jaw of *Vertigo bollesiana*. [Morse.]

Fig. 440.



Lingual membrane of *Vertigo bollesiana*. [Morse.]

Vertigo milium, Gould.—Shell very minute, subcylindrical, diminishing equally to both extremities; epidermis dark amber, or chestnut color; whirls five, rounded, very minutely striated, decreasing slightly to the apex, which is obtuse; suture deep; peristome white, slightly reflected; aperture lateral, half the width of the last whirl, within brownish, general shape semicircular, truncated abruptly and directly by the last whirl, a testaceous deposit upon which forms the transverse margin, and connects the two extremities of the peristome; circumference made up of two curves of different radius uniting in the peristome, where the junction causes an angle projecting inwards, the smaller curve comprising about one-fourth part, and forming the superior portion of the peristome; teeth six, two on the transverse margin, sharp, projecting, and tooth-like; one in the angle between the columellar and transverse margins, broad, massive, and prominent, with occasionally one or more tubercles about its base; one on the lower part of the columellar margin; two on the peristome, in the base of the aperture, and at the junction of the two curves; umbilicus rather wide. Length ⅓, diam. ⅔ mill.

Fig. 441.

Vertigo milium.

Pupa milium, Gould, Bost. Journ. Nat. Hist. III, 402, pl. iii, f. 23 (1840); IV, 359 (1843); Invertebrata, 187, f. 118 (1841).—DeKay, N. Y. Moll. 48, pl. iv, f. 44 (1843).—Adams, Vermont Mollusca, 157 (1842).—Pfeiffer, Mon. Hel. Viv. II, 362.—Binney, Terr. Moll. II, 337, pl. lxxi, f. 1.—Küster, in Chemnitz, ed. 2, 119, pl. xv, f. 39–42.

Vertigo milium, W. G. BINNEY, Terr. Moll. IV, 148.—MORSE, Amer. Nat. I, 669, f. 65, 66 (1868).

From New England to Texas.

Vertigo ovata, SAY.—Shell minute, ovate-conic, ventricose, dark amber-colored; whirls five, very convex, the last much inflated, diminishing rather rapidly to a somewhat acute apex, with an indentation towards the aperture; suture rather deep: peristome thin, somewhat expanded, with a groove behind and a thickening within; aperture in general outline semicircular, the curve consisting of segments of two different sized, but well defined circles, the smaller on the right at the junction of the peristome and body-whirl, comprising about one-fourth of the whole contour, and forming an angle at their junction; teeth generally six, two on the transverse margin, two on the columellar margin, the upper of which is massive, the lower pointed, and two on the peristome, in the base and at the junction of the two curves, sharp and prominent; umbilicus expanded. Length 3, diam. 1½ mill.; aperture 1 long.

Fig. 442.

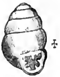
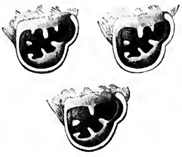


Fig. 443.



Vertigo ovata

Vertigo ovata, SAY, Journ. Acad. Nat. Sci. Philad. II, 375 (1822); ed. BINNEY, 26.—BINNEY, Terr. Moll. II, 334, pl. lxxi, f. 4.—W. G. BINNEY, Terr. Moll. IV, 148.—MORSE, Amer. Nat. I, 668, f. 57, 58 (1868).

Pupa ovata, GOULD, Bost. Journ. Nat. Hist. IV, 350, pl. xvi, f. 7, 8 (1843).—DEKAY, N. Y. Moll. 50, pl. iv, f. 50 (1843).—ADAMS, Vermont Mollusca, 157 (1842); Silliman's Journal, [1], XL, 271.—KÜSTER, in CHEMNITZ, ed. 2, 118, pl. xiv, f. 1, 2; xv, f. 35, 38.—PFEIFFER, Mon. Hel. Viv. II, 360; Symbolæ, II, 54.

Pupa modesta, SAY, Long's Exped. II, 25, pl. xv, f. 5 (1824); ed. BINNEY, 32, pl. lxxiv, f. 5.—GOULD, Invertebrata, 188, f. 119 (1841).

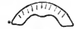
Pupa ovulum, Pfeiffer, olim, Symbolæ, I, 46.
Isthmia ovata, Morse, Journ. Portl. Soc. I, 38, f. 93; pl. x, f. 94 (1864).

From Maine to Texas. Also quoted from Mexico and Cuba.

Jaw arcuate, of uniform breadth, ends square and horizontal; anterior surface with longitudinal wrinkles; concave margin simple, with a median projection.

Lingual membrane with 90 rows of twenty-nine teeth (14—1—14); centrals tricuspid, laterals and uncini serrated.

Fig. 444.



Jaw of *Vertigo ovata*. [Morse.]

Fig. 445.

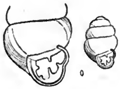
Lingual dentition of *Vertigo ovata*. [Morse.]

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8416	15	Massachusetts.	W. Stimpson.	......
8417	30	Portland, Me.	Dr. J. Lewis.	......
8418	4	Milwaukee, Wis.	I. A. Lapham.	......
8693	7	Massachusetts.	W. Stimpson.	Cab. series.

Vertigo ventricosa, Morse.—Shell umbilicate, ovate conic, smooth, polished; apex obtuse; suture deep; whirls four, convex; aperture semicircular, with five teeth, one prominent on the parietal margin, two smaller on the columellar margin, and two prominent within, contracting the aperture at the base; peristome widely reflected, the right margin flexuose, within thickened and colored. Length .07, breadth .045 inch. (*Morse.*)

Isthmia ventricosa, Morse, Ann. N. Y. Lyc. VIII, 1, f. 1-3 (Nov. 1865).
Vertigo ventricosa, Morse, Amer. Nat. I, 669, f. 61, 62 (1868).

Fig. 446.

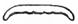


Vertigo ventricosa.

Maine, New Hampshire, and New York.

I have not seen this species. Mr. Morse says it has been confounded with *V. ovata*, but is one-fourth smaller, has one whirl less, and a more circular columellar margin to the aperture.

Fig. 447.

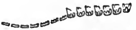


Jaw of *Vertigo ventricosa*. [Morse.]

Buccal plate wide, narrow, not produced in centre, but slightly curving at ends; cutting edge regularly waved.

Lingual formula 98 (13—1—13); central and lateral plates notched at outer posterior corners; central plate square, having three small denticles; plate indented at base of central denticle, which is the largest; lateral plates tridentate, inner denticle largest; uncini minutely notched.

Fig. 448.



Lingual membrane of *Vertigo ventricosa*. [Morse.]

Vertigo simplex, Gould.—Shell minute, cylindrical, obtuse at apex, smooth, chestnut color; whirls five, well rounded, separated by a deep suture; aperture circular, the peristome nearly continuous, simple or scarcely everted, except at its columellar margin, where it partially conceals a small umbilicus; no trace of a tooth has been detected in any specimen. Length 1⅔ mill.; breadth half as great.

Fig. 449.

Vertigo simplex, enlarged.

Pupa simplex, Gould, Bost. Journ. Nat. Hist. III, 403, pl. iii, f. 21 (1840); IV, 359 (1843); Invertebrata, 190, f. 121 (1841).—Pfeiffer, Mon. Hel. Viv. II, 302.—DeKay, N. Y. Moll. 52, pl. xxxvi, f. 347 (1843).—Binney, Terr. Moll. II, 343, pl. lxxii, f. 3.

Vertigo simplex, Stimpson, Shells of New England, 53 (no descr.).—W. G. Binney, Terr. Moll. IV, 148.—Morse, Amer. Nat. I, 670, f. 67, 68 (1868).

Canada and New England.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8802	9	Massachusetts.	W. Stimpson.	Cab. series.

SPURIOUS SPECIES OF VERTIGO.

Vertigo contracta, Adams, Gen. Rec. Moll. is the same as *Pupa contracta*.
Vertigo decora, Adams, Gen. Rec. Moll. is the same as *Pupa decora*.
Vertigo minuta, Adams, Gen. Rec. Moll. is the same as *Pupa rupicola*.

Vertigo pentodon, Say, is the same as *Pupa pentodon*.
Vertigo rupicola, Binney, is the same as *Pupa rupicola*.
Vertigo corticaria, Binney, is the same as *Pupa corticaria*.

Subfamily SUCCININÆ.

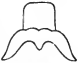
Jaw arcuate, at the convex edge lengthened into an additional nearly square plate, at its concave edge striated or ridged, with a short middle projection.

Lingual teeth in long, curving, transverse rows, centrals tricuspid, laterals bicuspid, uncini serrated.

SUCCINEA,[1] Dr.

Shell imperforate, thin, ovate or oblong; aperture large, obliquely oval; columella simple, acute; peristome simple, straight.

Fig. 450.



Jaw of *Succinea avara*. [Morse.]

Jaw with a subquadrate plate attached to its convex margin; strongly arcuate, ends pointed; anterior surface smooth, or ridged; concave margin simple, with a rostriform median projection.

Lingual membrane with curving transverse series of teeth; centrals tricuspid; laterals bicuspid; uncini serrate.

Fig. 451.

Lingual dentition of *Succinea avara*.

Subgenus SUCCINEA, Dr., s. str.

Shell oblong, spire produced, whirls 3–4, convex, the last large, rounded, aperture oval.

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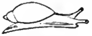
[1] To follow strictly the law of priority, *Neritostoma*, Klein, should be used for this genus.

Fig. 452.

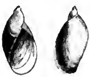


Animal of *Succinea rusticana.*

Animal resembling the animal of *Helix*, but shorter. Eye-peduncles short, expanded at their base or conoid; tentacles very short and small. Respiratory foramen in the mantle, in the angle at the posterior part of the aperture of the shell.

Succinea haydeni, W. G. Binn.—Shell elongate-oval, thin, shining, amber-colored; spire short, acute; whirls three, convex, the last marked with the wrinkles of growth, and irregular, heavy, spiral furrows; suture moderate; columella covered lightly with callus, and allowing all the interior whirls to be seen from below to the apex; aperture oblique, oval, five-sevenths the length of the shell, the lower portion of its margin considerably expanded. Length 21, diam. 9 mill.

Fig. 453.



Succinea haydeni.

Succinea haydeni, W. G. Binney, Proc. Aca. Nat. Sci. Philad. X, 114 (May, 1858); Terr. Moll. IV, 40, pl. lxxix, f. 1.—Pfeiffer, Mal. Blatt. 1859, 52.—Bland, Ann. N. Y. Lyc. VIII, 168, f. 14 (1865).—Tryon, Am. Journ. Conch. II, 236, pl. II, f. 20 (1866).

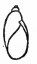
Nebraska, between the rivers Loup Fork and L'Eau qui Court.

Var. *minor*. Length 15 mill. Found by Mr. Robert Kennicott near the Red River of the North, and at Ft. Resolution, Great Slave Lake.

Cat No.	No. of Sp	Locality.	From whom received.	Remarks.
8371	1	Big Sioux.	......	......
8659	1	Nebraska.	......	Cab. series.
8660	3	N. Red River.	R. Kennicott.	''

Succinea retusa, Lea.—Shell ovate oblong, very thin, pellucid, yellowish; spire short; whirls three; aperture below dilate and drawn back. Diam. .3, length .7 inch. Ohio, near Cincinnati.

Fig. 454.



Succinea retusa.

A single specimen only of this species has come into my possession. It differs so much from any of the described species in the dilatation and retraction of the inferior part of the aperture, that I have not hesitated to consider it new. (*Lea.*)

Succinea retusa, Lea, Trans. Am. Phil. Soc. V, 117, pl. xix, f. 86 (1837); Obs. I, 229.—DeKay, N. Y. Moll. 55 (1843).—Pfeiffer, Mon. Hel. Viv. II, 525.—Binney,

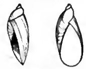
Terr. Moll. III, 65, 66.—W. G. Binney, Terr. Moll. IV, 37, pl. lxxix, f. 7.—Tryon, Am. Journ. Conch. II, 238, pl. II, f. 25 (1866).
Succinea campestris, Anthony, Ohio Cat., no descr., part (1843), No. 95.

Mr. Lea's original description and figure are copied above.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8388	2	M. of Yellowstone.	......	Named by Lea.
8654	1	" "	......	Cab. ser. Named by [Lea.

Succinea sillimani, Bland.—Shell oblong-ovate, thin, coarsely striate, shining, whitish? spire short, acute; whirls three, convex; suture impressed; aperture oblique, elongate-oval, angular above, affuse at the base; columella slightly arcuate, with a thread-like thickening above. Long. 20, diam. 8½ mill.; aperture 13 mill. long, 6 broad in middle.

Fig. 455.



Succinea sillimani.

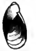
Succinea sillimani, Bland, Ann. N. Y. Lyc. VIII, 167, f. 13 (1865).—Tryon, Am. Journ. Conch. II, 236, pl. II, f. 21 (1866).

Humboldt Lake, Nevada.

The original description and figure are given above.

Succinea ovalis, Gould, not Say.—Shell ovate, somewhat conic, very thin, pellucid, watery horn-color, sometimes tinted roseate; periostraca shining, very minutely striate; whirls three, the last compressed and elongate when viewed above; spire short but acute; suture impressed; aperture produced by a deep truncation of the shell, elongated, more than three-fourths the length of the shell, patulous, expanding anteriorly, exhibiting the interior of the volutions; when viewed on the side of the aperture, the conical shape of the shell appears, the broadest part of the cone is below the centre of the aperture, and it tapers gradually to the apex. Extreme length 15 mill., of aperture 10.

Fig. 456.



Succinea ovalis, Gould, not Say.

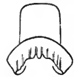
Succinea ovalis, Gould, Invertebrata, 194, f. 125 (1841).—Adams, Shells of Vermont, 270.—Binney, Terr. Moll. II, 78, pl. lxvii, a, f. 3.—W. G. Binney, Terr. Moll. IV, 37.—Pfeiffer, Mon. Hel. Viv. IV, 814.—Morse, Journ. Portl. Soc. I, 30, f. 77; pl. ix, f. 78 (1864); Amer. Nat. I, 607, f. 48 (1868).—Tryon, Am. Journ. Conch. II, 237, pl. II, f. 22 (1866).—Not of Say.
Succinea decampii, Tryon, Am. Journ. Conch. II, 237, pl. II, f. 23 (1866).

Canada and the Northern and Middle States.

This is not the *S. ovalis* of Say. That shell having been found identical with *S. obliqua*, Dr. Gould proposes retaining the name *ovalis* for this species.

Animal a little longer than the shell, whitish or amber-colored, and translucent, with minute black dots, scattered and in clusters of dots upon the surface, most frequent upon the head and upper part of neck. Foot free from dots. A black line running from the ocular points of the eye-peduncles through their length, and along the sides of the neck to the shell, marking the sheath of the eye-peduncles, which are rather short, thick at base, attenuated towards the end, bulb distinct; tentacles short, small, and rather conical. Respiratory cleft near the peristome of the shell, about midway between its centre and its junction with the last whirl.

Fig. 457.



Jaw of *Succinea ovalis*. [MORSE.]

Jaw arcuate, ends blunt; anterior surface with strong vertical furrows, which modify the concave margin.

Lingual membrane with eighty rows of (40—1—40) teeth; teeth small in proportion to the plates on which they rest; centrals with three small denticles, laterals bidentate; uncini serrated.

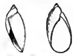
Fig. 458.

Lingual dentition of *Succinea ovalis*. [MORSE.]

Cat. No	No. of Sp	Locality.	From whom received.	Remarks.
8389	6	Milwaukee, Wis.	I. A. Lapham.	......
8390	1	Illinois.	......	......
8391	2	Minnesota.	I. A. Lapham. [land.	......
8392	43	Sing Sing, N. Y.	Rev. R. J. W. Buck-	......
8393	3	Milwaukee, Wis.	I. A. Lapham.	......
8394	19	Mohawk, N. Y.	Dr J. Lewis.	......
8633	5	....	W. O. Binney.	Cab. series.

Succinea higginsi, BLAND.—Shell depressed-oval, thin, obliquely striated, pellucid, somewhat shining, pale horn-colored; spire short, obtuse; suture deep; whirls three, convex, the last rather depressed; the columella scarcely arched, above conspicuously plicate; aperture angularly oval, frequently armed with a small, oblique, white tooth on the parietal wall; peristome simple, regularly arcuate. Length 15, diam. 7 mill.; aperture 11 mill. long.

Fig. 459.



Succinea higginsi.

Succinea higginsi, Bland, Am. Journ. Conch. II, 373, pl. xvii, f. 24 (1866).—Tryon, Am. Journ. Conch. II, 237, pl. ii, f. 24 (1866).

Put-in-Bay Island, Lake Erie.

Succinea haleana, Lea.—Shell obliquely ovate, shining, somewhat transparent, thin, golden color; spire short; sutures impressed; whirls three, convex; aperture large, broadly oval; outer lip regularly expanded; columella incurved. Diam. .17, length .23 inch. Alexandria, La. (*Lea.*)

Fig. 460.

Succinea haleana.

Succinea haleana, Lea, Proc. Acad. Nat. Sci. Philad. 1864, 109.—Tryon, Am. Journ. Conch. II, 241, pl. ii, f. 34 (1866).

Succinea halei, Lea, Journ. Acad. Nat. Sci. Philad.; Obs. XI, 136, pl. xxiv, f. 110.

Mr. Lea's original description is given above. Fig. 460 is drawn from a specimen received from him.

Succinea mooresiana, Lea.—Shell obliquely oval, minutely striate, opaque, whitish, somewhat thin; spire exserted; sutures impressed; whirls three, a little convex; aperture nearly round; outer lip expanded; columella incurved and twisted. Diam. .24, length .39 inch. Court House Rock on Platte River. (*Lea.*)

Fig. 461.

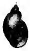
Succinea mooresiana.

Succinea mooresiana, Lea, Proc. Acad. Nat. Sci. Philad. 1864, 109; Journ. of same, pl. xxiv, f. 109; Obs. XI, 136, pl. xxiv, f. 109.—Tryon, Am. Journ. Conch. II, 235, pl. ii, f. 17 (1866).

The above is Mr. Lea's original description. Fig. 461 is drawn from a specimen furnished by him.

Succinea grosvenorii, Lea.—Shell obliquely ovate, striate, somewhat transparent, straw-yellow, and thin; spire exserted; sutures very much impressed; whirls four, convex; aperture nearly round, and rather large; outer lip expanded; columella bent in and twisted. Diam.

Fig. 462.



Succinea grosvenorii.

.32, length .51 inch. Santa Rita Valley, Kansas? and Alexandria, Louisiana.

Succinea grosvenorii, LEA, Proc. Acad. Nat. Sci. Philad. 1864, 109; Journ. Acad. Nat. Sci. Philad. pl. xxiv, f. 108; Obs. XI, 135, pl. xxiv, f. 108.—TRYON, Am. Journ. Conch. II, 232, pl. ii, f. 9 (1866).

Succinea forsheyi, LEA, Proc. Acad. Nat. Sci. Philad. 1864, 109; Journ. of same; Obs. XI, 134, pl. xxiv, f. 107.—TRYON, Am. Journ. Conch. II, 239, pl. ii, f. 28 (1866).

The original description of this species is given above and a figure of an authentic specimen. The same is given below of *S. forsheyi*, which appears to me identical.

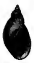
Fig. 463.

Succinea forsheyi.

Succinea forsheyi.—Shell obliquely elongate, smooth, polished, semitransparent, pale golden color, very thin; spire exserted, pointed; sutures impressed; whirls three, a little convex; aperture large, wide ovate; outer lip somewhat expanded; columella thin, incurved and twisted. Diam. .23, length .46 inch. Rutersville, Texas. (*Lea.*)

Succinea wilsoni, LEA.—Shell obliquely elongate, very much striate, transparent, deep golden color, and somewhat large, ovate; outer lip somewhat expanded; columella thin, incurved and twisted. Diam. .30, length .66 inch. Darien, Ga. (*Lea.*)

Fig. 464.



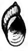
Succinea wilsoni.

Succinea wilsoni, LEA, Proc. Acad. Nat. Sci. Philad. 1864, 109; Journ. of same; Obs. XI, 133, pl. xxiv, f. 105.—TRYON, Am. Journ. Conch. II, 239, pl. ii, f. 27 (1866).

I have not seen this species. The original description and a fac-simile of the original figure are given above.

Succinea concordialis, GOULD.—Shell obliquely ovate, elongate, reflexed, apex acute, thin but firm, transparent, shining, feebly striated lengthwise and spirally, color pale honey-yellow, with the tip ruddy; whirls three and somewhat more, very oblique, the two uppermost very small, outer whirl somewhat compressed above the middle; suture well marked; aperture ample, not less than two-thirds the length of the shell, well rounded at base; columella regularly arcuated, more so than the peristome, simple, but its upper portion is reflexed and raised so as to form a marginal wall to the aperture, as

Fig. 465.



Succinea concordialis.

it enters the shell, and produces a slight fold where it disappears within the spire; a broad, thin callus covers the left margin, which is slightly detached anteriorly, so as to form the rudiment of an umbilicus. Length 14, of aperture 9 mill.

Succinea concordialis, Gould, Proc. Bost. Soc. Nat. Hist. III, 37 (June, 1848); in Terr. Moll. II, 82, pl. lxvii, a, f. 2.—Pfeiffer, Mon. Hel. Viv. III, 16.—W. G. Binney, Terr. Moll. IV, 41.—Tryon, Am. Journ. Conch. II, 239, pl. II, f. 29 (1866).

Succinea muaita, Binney, Terr. Moll. I, in tables.

Lake Concordia, in Texas.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8664	2	Lake Concordia, La.	W. G. Binney.	Cab. series.

Succinea luteola, Gould.—Shell of a conical, turreted form, sometimes rather corpulent, and again quite slender, the last whirl being much less ventricose in proportion than the upper ones, rather thick in substance; color, when young, pale yellowish-green or drab, becoming bleached or gray with age, the interior, however, sometimes having the bright yellow of yelk of egg, and always more or less tinted thus when living, becoming at last dead white; surface irregularly and loosely wrinkled; whirls four, forming a well-proportioned spire, the upper ones well rounded, and separated by a deep suture, the apex acute, colored yellow; last whirl conical at its upper third: aperture ovate, rather more than half the length of shell, the columellar extremity of the peristome somewhat incumbent; columella without a fold, rounded, its edge above being seen winding far within the spire. Length 12½, breadth 6 mill.

Fig. 466.

Succinea luteola.

Succinea luteola, Gould, Proc. Bost. Soc. Nat. Hist. June, 1848, III, 37; Terr. Moll. II, 75 pl. lxvii, c, f. 1 (1851).—W. G. Binney, Terr. Moll. IV, 41.—Tryon, Am. Journ. Conch. II, 239, pl. ii, f. 30 (1866). —Pfeiffer, Mon. Hel. Viv. III, 16.

Succinea texasiana, Pfeiffer, olim, Mon. Hel. Viv. II, 526; in Roemer's Texas, 456 (1849); in Chemnitz, ed. 2, 42, pl. iv, f. 21–23 (1854).

Succinea citrina, Shuttleworth, undescribed, teste Pfr.

Florida and Texas.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8379	11	Tamaulipas, Mex.	Lieut. Couch.	......
8380	19	Texas.	"	......
8657	3	"	"	Cab. series.

Succinea lineata, W. G. BINN.—Shell oblong-ovate, with three very convex whirls; spire elevated, acute; surface marked with irregular wrinkles of growth, between which are coarse parallel revolving lines, somewhat removed from each other; aperture large, about as long as one-half of the whole length of the shell, oval; columella folded; a deposition of callus on the parietal wall of the aperture. Greatest diam. 6, alt. 12 mill.

Fig. 467.

Succinea lineata.

Succinea lineata, W. G. BINNEY, Proc. Acad. Nat. Sci. Philad. 1857, 19; Proc. Bost. Soc. Nat. Hist. VI, 155 (April, 1857); Terr. Moll. IV, 38, pl. lxxx, f. 5.—TRYON, Am. Journ. Conch. II, 235, pl. ii, f. 16 (1866).

Fort Union, Nebraska Territory.

Cat. No.	No. of Sp	Locality.	From whom received.	Remarks.
8372	9	Ft. Union.	......	Type.
8373	6	Bet. Pike Lake and Ft. [Union.	Gov. J. J. Stevens.	......
8374	5	M. of the Yellowstone.	......	......
8375	1	Utah.	......	......
8376	1	Platte River, Neb.	......	......
8376	1	Loup Fork.	......	......
8377	7	Apple Creek, lat. 47°?	......	......
8378	1	Grindstone Creek.	......	......
8658	4	Yellowstone River.	......	Cab. series.
8806	5	Ft. Union.	......	......

Succinea avara, SAY.—Shell rather small, very thin and fragile, straw-colored, rosy, amber-colored or greenish; periostraca shining, or presenting minute hairy processes in the young; whirls three, very convex, separated by a deep suture; last whirl rather large, not much expanded; spire very prominent, acute; aperture ovate, rounded at both extremities, about half as long as the shell. Extreme length about 6 mill.

Fig. 468.

Succinea avara, enlarged.

Succinea avara, SAY, Long's Exped. II, 260, pl. xv, f. 6 (1822); BINNEY'S ed. 32, pl. lxxiv, f. 6.—GOULD, Invertebrata, 196, f. 127 (1841).—ADAMS, Shells of Vermont, 156 (1842).—DEKAY, N. Y. Moll. 54, pl. iv, f. 55 (1843).—PFEIFFER, Symbolæ, II, 56; Mon. Hel. Viv. II, 525; in CHEMNITZ, ed. 2, 51, pl. v, f. 18–20 (1854).—BINNEY, Terr. Moll. II, 74, pl. lxvii, c, f. 4.—W. G. BINNEY, Terr. Moll. IV, 35.—MORSE, Journ. Portl. Soc. I, 29, f. 75; pl. ix, f. 76 (1864); Amer. Nat. I, 607, f. 47 (1868).—TRYON, Am. Journ. Conch. II, 233, pl. ii, f. 11, 12 (1866).

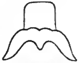
Succinea wardiana, LEA, Proc. Am. Phil. Soc. 1841, II, 31; Trans. IX, 3; Obs. IV, 3 (1844).—PFEIFFER, Mon. Hel. Viv. II, 525.

Succinea vermeta, SAY, teste GOULD (see doubtful species, p. 271).—TRYON, Am. Journ. Conch. II, 233, pl. ii, f. 10 (1866).

From Fort Simpson, on Mackenzie River, to the Gulf of Mexico; over all eastern North America.

A larger form is also found.

Fig. 469.



Jaw of *Succinea avara.*

Jaw strongly arcuate, ends curved and pointed; anterior surface smooth; concave margin simple, with a well-developed, acute median projection; convex margin waving.

Lingual membrane with 19—1—19 teeth, centrals tricuspid, laterals bicuspid, uncini serrated.

Fig. 470.

Lingual dentition of *Succinea avara.*

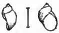
Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8367	1	Betw. Lac des Mille Lac and Lake of the Woods.	R. Kennicott.	......
8368	2	Apple Creek, lat. 47°.	......	......
8663	5	....	W. G. Binney.	Cab. series.
8762	50?	Massachusetts.	W. Stimpson.	......

Var. MAJOR.

Cat No.	No. of Sp	Locality.	From whom received.	Remarks.
8369	8	Mohawk, N. Y.	Dr. J. Lewis.	*S. vermeta*, Lewis, non {Say.
8662	6	" "	"	Cab. ser. do.

Succinea stretchiana, Bland.—Shell globose conic, thin, pellucid, shining, striatulate, greenish horn-colored; spire short, rather obtuse; suture deep; whirls three, convex, the last roundly inflated; columella arcuate, slightly thickened; receding; aperture oblique, roundly oval; peristome simple, with the margins joined by a thin callus. Length 6¼, diam. 5 mill.; aperture 5 mill. long.

Fig. 471.



Succinea stretchiana.

Succinea stretchiana, Bland, Ann. N. Y. Lyc. VIII, 168, f. 16 (1865).—Tryon, Am. Journ. Conch. II, 231, pl. II, f. 5 (1866).

Little Valley, Washoe County, Nevada, on the eastern slope of the Sierra Nevada, 6500 feet above the sea.

The original description and figure are given above.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
9361	1	Little Valley, Washoe Co., Nevada.	......	Type.

Succinea verrilli, Bland.—Shell ovate-conic, thin, striate, subpellucid, orange-yellow colored; spire elevated, obtuse, with globose apex, of a reddish tinge; whirls three, very convex; suture deep; aperture oblique, roundly oval; columella arcuate, with a slight callus; peristome simple, the margins joined with a very thin callus. Length 7, diam. 3½ mill.; aperture 4 mill. long, 3 wide.

Fig. 472.

Succinea verrilli.

Succinea verrilli, Bland, Ann. N. Y. Lyc. VIII, 169, *f.* 17 (1865).—Tryon, Am. Journ. Conch. II, 234, pl. ii, *f.* 15 (1866).

Salt Lake, Anticosti Island, Gulf of St. Lawrence.

The original description and figure are given above.

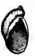
Buccal plate abruptly arched, with one prominent central projection.

Lingual formula about 80 rows (31—1—31). Plates notched at their outer posterior edges, longer than wide; central plate with three minute denticles, the middle one being largest; lateral plates bidentate, the outer denticle minute; uncini irregularly dentate or notched.

Animal (in alcohol) black.

Succinea aurea, Lea.—Shell very symmetrical in form, elongated oval, the texture very thin and lucid, and of a clear amber color; whirls three, the suture deeply impressed, and the whirls a little tabulated posteriorly; aperture narrow-ovate, acute posteriorly; the columella has an indistinct fold. Length 7½, breadth 3 mill.

Fig. 473.



Succinea aurea, enlarged.

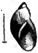
Succinea aurea, Lea, Trans. Am. Phil. Soc. IX, 4; Obs. IV, 4 (1844); Proc. 1841, II, 32.—Pfeiffer, Mon. Hel. Viv. II, 325.—Binney, Terr. Moll. II, 76, pl. lxvii, e, f. 3.—W. G. Binney, Terr. Moll. IV, 37.—Tryon, Am. Journ. Conch. II, 241, pl. ii, f. 33 (1866).

Succinea ovalis, var., Anthony, Shells of Ohio (1843), No. 45, no descr.

Ohio.

Succinea groenlandica, Beck.—Shell elongated, rather heavy, lightly wrinkled, of a light horn-color mixed with white; spire scalariform, bulbous; whirls four, the penultimate quite convex, the last equalling two-thirds the length of the shell; columella receding and narrowed, covered with a white callus; aperture oval; peristome simple, the right margin covered. Greatest length 8, breadth 5½ mill.; length of the aperture 5½, breadth 3½.

Fig. 474.



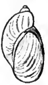
Succinea groenlandica.

Succinea groenlandica, Beck, Ind.—Pfeiffer, Mon. Hel. Viv. II, 529.—Möller, Ind. Moll. Gr. 4 (1842).—W. G. Binney, Terr. Moll. IV, 38, pl. lxxx, f. 4.—Tryon, Am. Journ. Conch. II, 234, pl. ii, f. 13 (1866).

Greenland.

Succinea obliqua, Say.—Shell ovate, pale green, yellowish-green, amber-colored, or cinereous, very thin and fragile, pellucid, sometimes roseate at apex; periostraca shining, minutely wrinkled or striated; whirls rather more than three, the last very large, and much expanded, and more or less oblique; spire very small, not prominent nor pointed; suture distinct, impressed; aperture oval, large and expanded, more or less oblique; columellar margin with a slight testaceous glazing; columella thin, sharp, narrowed; peristome thin, its edge blunted by the reflection of the periostraca. Greatest length 25, ordinary length 18 mill.

Fig. 475.



Succinea obliqua.

Succinea obliqua, Say, Long's Exped. II, 260, pl. xv, f. 7 (1824); Binney's ed. 32, pl. lxxiv, f. 7.—Adams, Shells of Vermont, 156, with fig. (1842).—DeKay, N. Y. Moll. 53, pl. iv, f. 53 (1843).—Pfeiffer, Mon. Hel. Viv. III, 15; in Chemnitz, ed. 2, 47, pl. v, f. 1, 2 (1854).—Binney, Terr. Moll. II, 69, pl. lxvii, b, f. 3, excl. syn. *totteniana*.—W. G. Binney, Terr. Moll. IV, 35.—Leidy, T. M. U. S. I, 258, pl. xiii, f. 1–3 (1851), anat.—Tryon, Am. Journ. Conch. II, 232, pl. ii, f. 7 (1866).

Succinea ovalis, Say, Journ. Acad. Nat. Sci. Phila. I, 15 (1817); Nich. Encycl. 3d ed. (1819); Binney's ed. 8.—Adams, Shells of Vermont, 156 (1842).—Deshayes, in Encycl. Méth. II, 20 (1830); Fér. Hist. *l. c.* II, 139 (excl. syn. Gould); in Lam. ed. 2, VIII, 319.—Pfeiffer, Mon. Hel. Viv. II, 524; III, 15 (excl. syn. Gould); in Chemnitz, ed. 2, 48, pl. v, f. 3, 4.

Succinea lineata, DeKay, N. Y. Moll. 53, pl. iv, f. 51 (olim), 1843.

Succinea campestris of all American authors except Say.—Gould, Invert. 195, f. 126 (1841).—DeKay, N. Y. Moll. 54, pl. iv, f. 54 (1843).

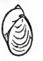
Succinea greerii, Tryon, Am. Journ. Conch. II, 232, pl. ii, f. 8 (1866).

From Gaspé to Georgia, and from the Red River of the North to Arkansas. It is also found fossil in the postpleiocene bluffs of the Mississippi River.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8381	6	Lake Winnipeg.	R. Kennicott.	......
8382	3	Lake of the Woods.	"	......
8383	1	Halifax, N. S.	......	......
8384	1	Betw. Lac des Mille Lac and Lake of the Woods.	R. Kennicott.	......
8385	1	Milwaukee, Wisc.	I. A. Lapham.	......
8386	20	Hiram, Ohio.	......	......
*8387	10	Mohawk, N. Y.	Dr. J. Lewis.	......
8656	4	....	W. G. Binney.	Cab. series.
8825	10	Massachusetts.	W. Stimpson.	......
9177	30+	Vermont.	J. E. Chittenden.	......

Succinea totteniana, Lea.—Shell obliquely-ovate, of a greenish color, thin, shining, somewhat diaphanous, obsoletely striated; whirls three, convex, the last very large and globose; spire very short; suture impressed; aperture large, oval, oblique; peristome thin, acute. Greatest length 16 mill.

Fig. 476.



Succinea totteniana.

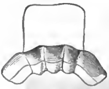
Succinea totteniana, Lea, Proc. Phil. Soc. II, 32 (1841); Trans. Am. Phil. Soc. IX, 4 (1844); Obs. IV, 4.—Pfeiffer, Mon. Hel. Viv. II, 523; III, 15.—Gould, in Terr. Moll. II, 65, 72, pl. lxvii, b, f. 2.—W. G. Binney, Terr. Moll. IV, 35.—Morse, Journ. Portl. Soc. I, 29, f. 73; pl. ix, f. 74 (1864); Amer. Nat. I, 606, f. 46 (1868). —Tryon, Am. Journ. Conch. II, 230, pl. ii, f. 1 (1866).

Succinea obliqua, teste Binney, *l. c.*

New England and New York.

Generally considered a variety of *S. obliqua*. It is a thinner and more fragile shell, proportionally more ventricose in form, with a shorter spire and larger aperture; it has a decided green color, almost unshaded with yellow, while in *S. obliqua* the amber yellow predominates.

Fig. 477.

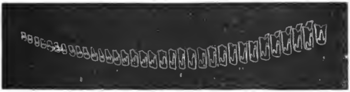


Jaw of *Succinea totteniana*. (Morse.)

Jaw arcuate, ends blunt; anterior surface with three heavy folds, modifying the concave and convex margins.

Lingual membrane with 100 rows of (33—1—33) long, slender teeth; centrals tricuspid, laterals bicuspid; uncini short, with three short teeth.

Fig. 478.

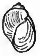


Lingual dentition of *Succinea totteniana.* [Morse.]

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8388	3	New York.	Dr. J. Lewis.	......
8655	5	....	W. G. Binney.	Cab. series.

Succinea campestris, Say.—Shell yellowish-white, or yellowish horn-color, rounded-ovate; periostraca shining, wrinkled; whirls three, not oblique, the last whirl large and ventricose, the other two constituting the spire, spire short, with acute apex; aperture ample, not much elongated, rounded anteriorly; peristome thin and sharp. Length 15, of aperture 10 mill.

Fig. 479.

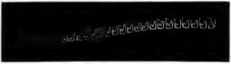


Succinea campestris.

Succinea campestris, Say, Journ. Acad. Nat. Sci. Philad. I, 281 (1817); Nich. Encycl. 3d ed. (1819); Binney's ed. 12.—Ferussac, Tabl. Syst. 31, pl. xi, *f.* 12.—Pfeiffer, Symbolæ, II, 56 (excl. syn. Gould); Mon. Hel. Viv. II, 524 (excl. do.); III, 15 (excl. syn. DeKay); in Chemnitz, ed. 2, 48, pl. v, f. 5, 6 (1854).—Deshayes, in Fer. II, 139.—Binney, Terr. Moll. II, 67, pl. lxvii, b, f. 1.—W. G. Binney, Terr. Moll. IV, 32.—Tryon, Am. Journ. Conch. II, 231, pl. ii, f. 4 (1866), not of DeKay, 54, Adams, Linsley, Anthony, Prescott (abs. descr.).
Succinea inflata, Lea, Trans. Am. Phil. Soc. IX, 5; Obs. IV, 5 (1844); Proc. II, 31 (1841).—Pfeiffer, Mon. Hel. Viv. II, 526; in Chemnitz, ed. 2, 49, pl. v, f. 9–11 (1854).—W. G. Binney, Terr. Moll. IV, 34, pl. lxxx, f. 11.—Tryon, Am. Journ. Conch. II, 230, pl. ii, f. 2 (1866).
Succinea unicolor, Tryon, Am. Journ. Conch. II, 230, pl. ii, f. 3 (1866).

It is a strictly southern species, observed as yet only in Florida and Georgia, and has been confounded with *S. obliqua.*

Fig. 480.



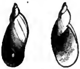
Lingual dentition of *Succinea campestris.*

Lingual membrane with 50 rows of (30—1—30) teeth; centrals obtusely tricuspid; laterals bicuspid; uncini tridentate, the inner tooth much the largest.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8370	7	South Carolina.	Lieut. Kurtz.	......
8661	6	St. Simon's Island, Ga.	J. Postell.	Cab. series.
8840	1	....	Lieut. Kurtz.	......

Succinea hawkinsii, BAIRD.—Shell elongate-obovate, thin, pellucid, shining, undulately striated, pinkish, within pearly; spire acute; whirls four, convex, the last equalling two-thirds the shell's length; suture impressed; aperture oval, effuse below. Length ¾, lat. ⅓ inch.

Fig. 481.



Succinea hawkinsii.

Hab. Lake Osoyoos, British Columbia. (*Brit. Mus.*)

This shell is of an elegant form, and of a pinkish color, with the interior of a pearly lustre. It is smooth and shining, but marked with waved striæ of lines of growth. It resembles very much in figure the *Succinea pfeifferi* of Europe, but is of a still more elegant shape, and of a brighter hue.

I have named it after Lieut. Col. Hawkins, R. E., Commissioner of the British North American Boundary Commission. (*Baird.*)

Succinea howkinsii, BAIRD, Proc. Zool. Soc. 1863, 68.—BLAND, Ann. N. Y. Lyc. VIII, 168, f. 16 (1865).—TRYON, Am. Journ. Conch. II, 240, pl. ii, f. 31 (1866).

Fig. 481 is copied from a tracing of Baird's forthcoming plate, kindly furnished me by Mr. Carpenter.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
9321	2	E. of Ft. Colville, W. T.	N. W. Bound. Surv.	......

Succinea cingulata, FORBES.—Shell oblong-ovate, scarcely oblique, rather solid, striated, shining, tawny-amber colored, often with white spiral lines; spire drawn out, obtuse; whirls four, rather convex, the last equalling two-thirds the shell's length; aperture elongate-ovate, acute above, obliquely receding behind the axis at the base; columella arched. Length 12, breadth 6 mill.; of aperture 7 long, 3 broad at middle.

Fig. 482.

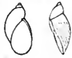
Succinea cingulata. [FORBES, *l. c.*]

Succinea cingulota, FORBES, Proc. Zool. Soc. 1850, 56, pl. ix, f. 8.—PFEIFFER, Mon. Hel. Viv. III, 17; IV, 815.—TRYON, Am. Journ. Conch. II, 241, pl. ii, f. 35 (1866).

Mazatlan.

Succinea rusticana, Gould.—Shell elongate, ovate conical, rather large, thin and fragile, pale greenish horn-color, surface rude and without lustre, coarsely and irregularly marked by the lines of growth; spire acute, of three or more moderately convex whirls, separated by a well-impressed suture, the last whirl large and long, narrowing towards the base; body portion of the face of the shell moderately large; aperture ovate, three-fourths the length of the shell; fold of the columella distinct. Length of axis 12½, breadth 6½ mill.

Fig. 483.



Succinea rusticana.

Succinea rusticana, Gould, Proc. Bost. Soc. Nat. Hist. II, 187 (Dec. 1846); Mollusca of Expl. Exped. 28, f. 29 (1852).—Pfeiffer, Mon. Hel. Viv. II, 523.—W. G. Binney, Terr. Moll. IV, 6, pl. lxxix, f. 14.—Tryon, Am. Journ. Conch. II, 263, pl. ii, f. 19 (1866).

Oregon to Tulare Valley, California.

For a figure of the animal, see page 256.

Cat. No.	No. of Sp.	Locality.	From whom received	Remarks.
8366	1	Oogo Creek, Cal.	Lt. R. S. Williamson.	......

Succinea nuttalliana, Lea.—Shell lanceolate-ovate, thin and fragile, of a dull horn-color, somewhat rudely undulated by the lines of growth; composed of about three tumid whirls, forming a conical spire, the last whirl constituting nearly the whole shell; suture well marked; aperture nearly two-thirds the length of the shell, ovate, broadly rounded in front, the posterior angle being also somewhat rounded by the abrupt curvature of the peristome; columella very gently curved, the region being somewhat gibbous; no fold on the columella, but in the region of the spire it is slightly sinuous. Length 13, of aperture 10 mill.

Fig. 484.

Succinea nuttalliana.

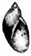
Succinea nuttalliana, Lea, Proc. Am. Phil. Soc. II, 32 (1841); Trans. IX, 4; Obs. IV, 4 (1844).—Pfeiffer, Mon. Hel. Viv. II, 523.—Binney, Terr. Moll. II, 81, pl. lxvii, a, f. 4.—W. G. Binney, Terr. Moll. IV, 6.—Tryon, Am. Journ. Conch. II, 236, pl. ii, f. 26 (1866).

Oregon and California.

Cat. No	No. of Sp.	Locality.	From whom received.	Remarks.
8330	1	Interior Oregon.	Com. Wilkes.	......
8331	2	" "	"	......
8354	1	" "	"	Cab. series.
9235	10	Wright's L., Cal.	Newberry.	Teste Lea.
9236	3	Rhett's L., Cal.	"	"

Succinea oregonensis, Lea.—Shell elongated ovate, thin, of a somewhat saffron-yellow color, rather coarsely, though obtusely and distantly striated transversely; spire with two and a half or three well-rounded whirls, separated by a distinct suture, the last whirl seven-eighths the length of the shell; aperture two-thirds the length of the shell, strictly ovate, one-third longer than broad; columella arcuate, but not folded, a thin white callus of considerable extent covering it. Length 6¼; greatest lateral diameter 3⅛, least 2⅜ mill.

Fig 485.



Succinea oregonensis, enlarged.

Succinea oregonensis, Lea, Proc. Am. Phil. Soc. II, 32 (1841); Trans. IX, 5; Obs. IV, 5 (1844).—Pfeiffer, Mon. Hel. Viv. II, 523.—Binney, Terr. Moll. II, 77, pl. lxvii, f. 2.—W. G. Binney, Terr. Moll. IV, 6.—Tryon, Am. Journ. Conch. II, 235, pl. ii, f. 18 (1866).

Succinea gabbii, Tryon, Am. Journ. Conch. II, 234, pl. ii, f. 14 (1866).

Oregon and California.

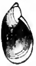
Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
6714	2	San Francisco.	Rowell.	Cab. series.

Subgenus BRACHYSPIRA, Pfr.

Shell ovate, inflated; spire very short, acuminate; last whirl flattened, shield-shaped; aperture ample, angular.

Succinea salleana, Pfeiffer.—Shell depressed ovate, very thin, delicately striated, irregularly marked with impressed spiral lines, pellucid, shining, whitish horn-colored; spire very short, subtuberculous; whirls two and a half, the penultimate convex, the last exceeding three-fourths the length of the shell; columella with a slight callus, strictly receding; aperture subparallel to the axis, angularly oval; peristome subthickened, its right end scarcely arched. Length 19, diam. 10, height 17 mill; length of aperture 16 mill., breadth below middle 9 mill.

Fig. 486.



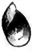
Succinea salleana.

Succinea salleana, Pfeiffer, Proc. Zool. Soc. Nov. 1849, 133; Mon. Hel. Viv. III, 16; in Chemnitz, ed. 2, 49, pl. v, f. 7, 8.—W. G. Binney, Terr. Moll. IV, 42, pl. lxxix, f. 18. —Tryon, Am. Journ. Conch. II, 240, pl. ii, f. 32 (1866).

Near New Orleans.

Succinea effusa, Shuttleworth.—Shell depressed-oval, very thin, transparent and shining, lightly striated, grayish horn-colored; spire remarkably short, acute; whirls two and a half, the last one very much the largest, depressed, equalling five-sixths the length of the shell; columella scarcely rounded and hardly receding; aperture very large, oblique and oval; peristome simple, regularly rounding. Length 12, diam. 7 mill.; length of the aperture 10, breadth 6 mill.

Fig. 487.



Succinea effusa.

Succinea effusa, Shuttleworth, MSS.—Pfeiffer, Mon. Hel. Viv. III, 17; In Chemnitz, ed. 2, 42, pl. iv, f. 18–20 (1854).—W. G. Binney, Terr. Moll. IV, 41, pl. lxxx, f. 12.—Tryon, Am. Journ. Conch. II, 231, pl. ii, f. 6 (1866).

East Florida.

Doubtful and Spurious Species of Succinea.

Succinea putris, Lin. (Deshayes, Encycl. Méth. 21; DeKay, 1839, 31; Ferussac, Tabl. Syst. 9), and

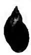
Succinea amphibia, Drap. (Forbes, Brit. Ass. 1837, 144; Ferussac, Tabl. Syst.; Binney, Terr. Moll. II, 159; Mrs. Sheppard, Tr. Lit. Hist. Soc. Quebec, 1829, I, 194), have been quoted from America. Having never seen a well-authenticated specimen of either, I omit them.

Succinea vermeta, Say, New Harm. Diss. II, 230 (1829); Desc. 23 (1840); ed. Binney, 38 (*S. venusta*, W. G. B., err. typ.). Gould quotes this in the synonymy of *S. avara*. See Terr. Moll. II, 64, 74.

Succinea aperta, Lea, Trans. Am. Phil. Soc. VI, 101, pl. xxiii, f. 101; Obs. II, 107 (1839), is said by Gould (Terr. Moll. II, 67) to be identical with *S. rotundata* of Sandwich Islands.

Succinea pellucida, Lea (Proc. Acad. Nat. Sci. Philad. 1864, 109; Journ. of same; Obs. XI, 134, pl. xxiv, f. 106), appears to me to be *Limnæa columella*. A figure of an authentic specimen, received from Mr. Lea, is here given.

Fig. 488.



Succinea pellucida.

Spurious Species of Helicidæ.

Bulimus (*Partula*) *bataviæ*, var. *β. minor*. United States, Grateloup (Soc. Lin. de Bord. XI, 165).

Partula otaheitana, Fer. United States (Grateloup, *l. c.* p. 426).

Agatina fuscata, Rafinesque, is probably not found in the United States. (See Terr. Moll. I, 50.)

To the Terrestrial Mollusks, I, p. 348 *et seq.*, and IV, p. 152,[1] I refer for information regarding the following species of Rafinesque:

Zolotrema, Raf.
Hemiloma ovata, Raf.
Menomphis, Raf.
Aplodon nodosum, Raf.

---

[1] See also Binney's and Tryon's ed. of Rafinesque's Complete Writings.

Chimotrema planiuscula, RAF.
Hemiloma avara, RAF.
Mesodon maculata, RAF.
Mesomphix, RAF.
Odomphium, RAF.
Odotropis, RAF.
Omphalina, RAF.
Omphalina cuprea, RAF.
Stenostoma convexa, RAF.
Stenotrema convexa, RAF.
Toxostoma globularis, RAF.
Toxotrema globularis, RAF.
Toxotrema complanata, RAF.
Triodopsis lunula, RAF.
Trophodon, RAF.
Xolotrema lunula, RAF.
Xolotrema triodopsis, RAF.

Oxyurus quadrilus, RAF., is a typographical error of my own in my "Notes," No. 4. No such name was proposed by him.

FAMILY ARIONIDÆ.

Lingual membrane with numerous similar, transverse rows of teeth.

Jaw smooth with a central projection, or ribbed and having no central projection.

Body elongate, attached its whole length to the upper surface of the foot, or more or less spiral and prominent on the middle of the upper surface of the foot. Eyes at the end of long, cylindrical, retractile peduncles; tentacles shorter, retractile. Mantle thin, small, discal or spiral, on the middle of the back; respiratory orifice subcentral, on the right side. Foot narrow, elongate, usually with a distinct locomotive disk, with a posterior, distinct gland. Vent near the respiratory orifice. Orifice of reproductive organs usually behind the right peduncle, or below the respiratory orifice.

Shell thin, shining; peritreme acute, simple or sometimes internal and rudimentary.

This family contains numerous genera and species found in every quarter of the globe. In North America it is represented by only two genera, *Arion* and *Zonites*. Their habits are respectively the same as those of *Limax* and *Hyalina*.

The shell exists in various stages of development in the *Arionidæ*, in some containing a portion of the animal in spiral, in others being internal, and the body attached to the foot in its whole length. This and the characteristics of the mucous pore have suggested the two subfamilies *Arioninæ* and *Zonitinæ*.

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SUBFAMILY ARIONINÆ.

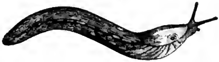
Body elongate, attached its whole length to the upper surface of the foot. Mantle shield-like, simple, entirely inclosing a flat, oblong, not spiral shell. Subcaudal gland lunate, transverse, horizontal.

This subfamily corresponds with the family *Arionidæ* of H. & A. Adams. There are but two genera at present known, *Arion* and *Geomalacus*. The latter has been found only in Ireland. It differs from *Arion* in having a distinct internal shelly plate, and in the position of the orifice of the reproductive organs being below the right eye-peduncle.

ARION, FERUSSAC.

Posterior termination of body obtuse. Integuments crowded with elongated tuberosities on the back, and on the sides with elongated tubercular plates having furrows between. Mantle anterior, oval, small, covered with granulations, free at the front and on the sides, attached posteriorly, containing in its posterior part numerous fine calcareous sandy grains. Locomotive disk not expanded at the margin, when the animal is fully extended very narrow, having in some species a narrow median band, and in others not. Respiratory orifice at the anterior margin of the mantle, small. Anal orifice contiguous to the former. Orifice of organs of generation under the two last. On the upper part of the posterior extremity of the body is a triangular pore or sinus, with the point directed forwards, a process or projection of the integument serving as a cover to the sinus.

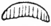
Fig. 489.



Arion fuscus.

Jaw with broad, crowded, anterior ribs and marginal denticulations.

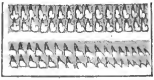
Fig. 490.



Jaw of *Arion fuscus*. [Moq.-Tand.]

The lingual ribbon is broad, composed of a median row of tricuspid denticles, the central toothlet of each being long and acutely pointed, the side toothlets short and blunt. The lateral teeth are modifications of the central, 31 in number, but bicuspid, the inside toothlet of the central being omitted in the laterals on the side nearest the central line, and the teeth gradually changing as they pass off laterally.

Fig. 491.



Lingual dentition of *Arion fuscus*.

The genus *Arion* was separated from *Limax* by M. Ferussac, to contain those species of the latter genus having a terminal pore or sinus. It is universally recognized, and has been fortunate in escaping any confusion of synonymy.

The habits of the North American species have been given under *Limacidæ*.

The internal calcareous grains which represent the shell are in some species isolated, in others aggregated into a nearer resemblance to the internal plate of *Limax*. On this distinction are based the subgenera *Lochea* and *Prolepis*.

SUBGENUS **PROLEPIS**, Moq.-Tand.

Shield covering an imperfect, rugose, shell-like plate, formed by the aggregation of a certain number of calcareous granulations.

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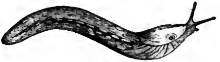
Arion fuscus, Müller.—Color whitish or light ashy, sometimes with a tinge of brown, or dark grayish; an obscure, ill-defined dark colored line or band rises where the mantle meets the base of the tentacles on both sides, and extending along the whole length of the mantle to its posterior extremity converges towards the line of the opposite side; another band proceeding from under the posterior edge of the mantle, not quite continuous with the above described line, runs along the sides of the body to its extremity. Body cylindrical, narrow, when extended very much elongated, expanding a little towards its extremity, and ending in a flat and rounded termination; its upper surface is covered with narrow, oblong, prominent glands, appearing sometimes as if carinated, and arranged in parallel rows, the flanks with elongated tuberculated plates and finer granulations. Head darker than the body, projecting very little beyond the mantle. Eye-peduncles blackish, one-eighth the length of the body, stout, bulbs translucent, ocular spot at the superior part, black. Tentacles immediately under the eye-peduncles, very short, conical. Mantle small, oval, narrow, commencing just behind the insertion of the eye-peduncles, less than one-third of the length of the animal; covered with granulations tending to a vermiform shape. Disk of the foot whitish, without a separate locomotive band, the marginal boundary between it and the body marked by a furrow, projecting beyond the body posteriorly. Respiratory foramen small, with a cleft to the margin of the mantle. Between the eye-peduncles is a tubercular ridge with furrows on each side. The triangular mucus pore is on the upper surface of the posterior extremity, is very apparent, and has a process of the skin which seems to cover it, and sometimes to project above it. When fully grown, the extreme length is more than 50, its usual length about 25 mill. Internal granulations coarsely united or aggregated into a somewhat ovular, semitransparent, very granular plate.

Fig. 492.



Arion fuscus.

Limax fuscus, Müller, Hist. Verm. II, 11 (1774).

Arion hortensis, Ferussac, Hist. 65, pl. ii, f. 4, 6; Suppl. p. 96 n (1819).—Binney, Bost. Journ. Nat. Hist. IV, 170 (1842); Terr. Moll. II, 27, pl. lxiv, f. 1; lxv, f. 2 (1851).—Leidy, T. M. U. S. I, 249, pl. ii, f. 1–4 (1851), anat.—DeKay, N. Y. Moll. 23 (1843).—Reeve, Brit. L. and F.-W. Moll. 11, fig.

Arion fuscus, Moquin-Tandon (which see for further foreign synonyms).

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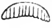
The jaw is described by Moquin-Tandon as moderately arched, of a light tawny color, brownish near the concave margin; extremities a little attenuated; anterior ribs about twelve, well marked, especially when the jaw is dry, flattened, marginal crenulations perfectly distinct, very obtuse.

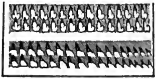
Fig. 493.



Jaw of *Arion fuscus*.

Lingual membrane broad, teeth 31—1—31; central teeth tricuspid, laterals bicuspid, uncini with a single cusp.

Fig. 494.



Lingual dentition of *Arion fuscus*.

Found near Boston. It is an introduced species common over the whole of Europe.

When the animal is fully extended, the mantle occupies less than a fourth part of its whole length, and the dark lines on the mantle and back are continuous with each other. The head only projects from the mantle, the neck not being visible. Its surface is constantly covered with a watery mucus, and it suspends itself with a thread of mucus like the other species. The mucous secretion from the terminal pore is transparent and very viscid. It is not distinguished by any considerable variety of color or markings. It occurs in small numbers in the vicinity of Boston, under stones, at road-sides, in company with *Limax agrestis*, and more plentifully in gardens within the city. In the remarks on this species, formerly published by Dr. Binney, he hesitated in considering it to be identical with the foreign species of the same name. Having later found it somewhat numerous in a locality in Boston, he procured specimens agreeing very well with foreign descriptions and figures, especially with that variety described by M. Ferussac as "grisens, unicolor, fasciis nigris," and had no longer any doubt on the subject. The specimens found in gardens are, however, much larger than the size indicated by the descriptions. It is called a small species by both

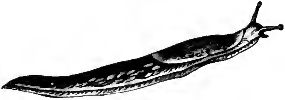
M. Ferussac and M. Lamarck, and so it is, as it exists in the country; but in the city it is sometimes two inches in length, when not fully extended, and of a corresponding bulk. The dark lines are most strongly marked in the large variety. The small variety is more delicate in its markings, and has a tinge of yellow on the foot. It is still restricted in its distribution, so far as known, to the neighborhood of Boston alone.

SUBGENUS LOCHEA, Moq.-Tand.

Shield covering small, isolated, unequal, calcareous granulations

Arion foliolatus, GOULD.—Color a reddish-fawn, coarsely and obliquely reticulated with slate-colored lines forming areolæ, which are indented at the sides, when viewed by a magnifier, so as to resemble leaflets; the cuirass is concentrically mottled with slate-color, and the projecting border of the foot is also obliquely lineated. The body is rather depressed, nearly uniform throughout, and somewhat truncated at the tip, exhibiting a conspicuous pit, which was probably occupied by a mucus gland. The shield is very long, smooth, and has the respiratory orifice very small, situated a little in front of the middle. The eye-peduncles are small and short. Length 85 mill.

Fig. 495.



Arion foliolatus.

Arion foliolatus, GOULD, Moll. U. S. Expl. Exped. 2, f. 2, a, b (1852).—BINNEY, Terr. Moll. II, 30, pl. lxvi, f. 3 (1851).—W. G. BINNEY, Terr. Moll. IV, 6.

Jaw —?

Lingual membrane —?

Found at Discovery Harbor, Puget Sound.[1]

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[1] It is erroneously quoted from Boston, by Grateloup, Distr. Geog. des Limaciens, p. 8.

The position of the orifice of respiration on the anterior portion of the shield, and the presence of the mucus pore at once indicate the generic position of this species. I have had no opportunity of examining the jaw or the rudimentary granules.

It is readily distinguished by the leaf-like areolæ which mark the surface, and suggest the specific name.

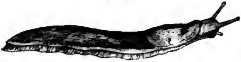
SPURIOUS SPECIES OF ARION.

Arion (Lochea) empiricorum is quoted without authority or description from the Western States by GRATELOUP (Distr. Geogr. de la Famille des Limaciens).

ARIOLIMAX, MÖRCH.

Body attenuated towards the posterior extremity, which is carinated strongly. Surface with oblong tuberosities. Mantle anterior, bluntly truncated before and behind, minutely granulated, free at the front and sides, attached posteriorly, containing a testaceous rudiment. Longitudinal furrows along the sides above the foot. Locomotive disk —? Respiratory orifice at the posterior third of the shell. Anal orifice —? Orifice of the generative organs —? A caudal mucus pore.

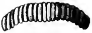
Fig. 496.



Ariolimax columbianus, one-half natural size.

Testaceous rudiment hexagonal, longer than wide, ends pointed acutely, not spiral.

Fig. 497.



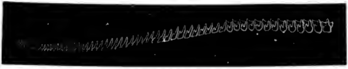
Jaw of *Ariolimax columbianus*.

Jaw arcuate, with numerous crowded anterior ribs, denticulating the concave margin.

Lingual membrane (of *A. columbianus*) very broad and long, composed of about 120 rows of teeth, each row containing 113 teeth (56—1—56);

central teeth large, with a long median cusp, side cusp obsolete; lateral teeth and uncini bicuspid, the inner cusp longer and more slender than the outer, and becoming proportionally still more slender and lengthened as the teeth are modified in passing off laterally.

Fig. 498.

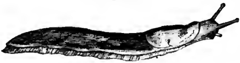


Lingual membrane of *Ariolimax columbianus*.

This genus is founded on the large species inhabiting the Pacific States, known as *Limax columbianus*. It is readily distinguished from *Arion* by its internal shelly plate, and the position of the respiratory orifice; from *Limax* by its dentate jaw. The only species of *Geomalacus* yet known has an internal plate, but its respiratory orifice is much more anterior.

Ariolimax columbianus, Gould.—Color a dark, dirty, greenish-yellow, either uniform or in some varieties clouded with large purplish-black, irregular blotches. The body is large and corpulent, the anterior portion elevated, with the back rounded, and the posterior portion strongly carinated; at the posterior tip there is apparently a mucus pore. The margin of the foot extends beyond the mantle and forms a ruffle around the animal, with transversely oblique markings. The surface is tessellated with coarse elongated papillæ arranged longitudinally. The cuirass is broad, truncated in front, minutely granulated, with the respiratory orifice at the posterior third. Face vertically wrinkled; eye-peduncles rather short, thickened at base, colored like the body and finely granulated; tentacles long and slender. Length 5½ inches.

Fig. 499.

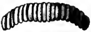


Ariolimax columbianus, reduced one-half.

Limax columbianus, GOULD, in Terr. Moll. II, 43, pl. lxvi, f. 1 (1851); U. S. Expl. Exped. Moll. 3, f. 1, a, b (1852).
Ariolimax columbianus, MÖRCH, Mal. Blatt. VI, 110.—W. G. BINNEY, Am. Journ. Conch. 1, 48, pl. vi, f. 11-13.

Internal shell longer than broad, hexagonal, ends pointed.

Fig. 500.

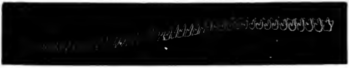


Jaw of *Ariolimax columbianus*.

Jaw narrow, arcuate, dark horn or reddish; anterior surface with more than fifteen coarse, crowded ribs, denticulating the concave margin.

Lingual membrane very broad, teeth 57—1—57; centrals tricuspid; laterals and uncini bicuspid.

Fig. 501.



Lingual membrane of *Ariolimax columbianus*.

Specimens referred to this species have been found in Washington Territory, Oregon, and California (Strs. of Fuca to Santa Barbara, *Cooper*).

In form, marking, and coloring it may be compared to *Arion empiricorum* of Europe.

Dr. Cooper remarks:—

"This large slug abounds in the dense damp forests near the Pacific coast, and was not observed by me in the dry region east of the Cascade Mountains. It is to be found every month of the year in Washington Territory, being even more abundant in the rainy winter than in warmer seasons; its activity being checked only by extreme cold, while it cannot bear continued drought. It not unfrequently drops from the trees, &c. This slug grows to the length of six inches, but shrinks to a third of that size in alcohol. Its surface is smooth, not rugose, when alive, as represented in Dr. Binney's plate, and its color is a pale yellowish-olive, usually more or less blotched with black." (Pac. R. R. Rep. p. 377.)

Cat. No.	No. of Sp	Locality.	From whom received.	Remarks.
8450	2	....	Lt. W. P. Trowbridge.	......
4283	1	San Francisco, Cal.	"	......
4211	1	Oregon City.	Lt. R. S. Williamson.	......
4233	4	Puget Sound.	......	......
4231	7	" "	Com. Wilkes.	......
8452	1	" "	"	......
4226	2	Port Oxford, Cal.	Lt. W P. Trowbridge.	......
4227	2	....	"	......
5543	1	W. Coast.	......	Cab. series.
4212	1	Cape Flattery, W. T.	Lt R S Williamson.	......

SUBFAMILY ZONITINÆ.

Body more or less spiral, prominent from the middle of the upper part of the foot, and covered with a more or less developed spiral shell, sometimes hidden by the reflexed edge of the mantle. Subcaudal gland linear, perpendicular.

The *Zonitinæ* correspond to the *Stenopidæ* of H. & A. Adams. There are numerous genera found in every quarter of the globe, but represented in North America by *Zonites* alone.

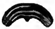
ZONITES, MONTF.

Shell broadly umbilicated, orbiculate, convex or discoidal, striated or decussated, beneath smooth and shining; whirls 6 or 7, gradually increasing in size; aperture oblique and lunate; peristome straight, acute, and slightly thickened internally.

Animal with a caudal mucus pore.

Jaw arcuate, large, simple, concave margin with a strong median projection.

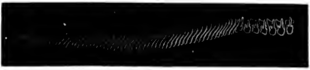
Fig. 502.



Jaw of *Zonites fuliginosa.*

Lingual membrane broad, teeth long and slender, centrals tricuspid, laterals bicuspid, uncini aculeate, curved. The central

Fig. 503.



Lingual dentition of *Zonites fuliginosa.*

and lateral teeth are arranged in straight, transverse rows, the uncini in somewhat diagonal rows, thus dividing the lingual membrane into three distinct transverse sections.

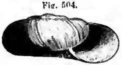
The species of this genus are allied to the *Hyalinæ* by the character of the shell, jaw, and lingual dentition, but differ from them in the presence of the caudal mucus pore.

SUBGENUS ÆGOPIS, Fitz.

Shell widely umbilicated, orbicularly convex or depressed, striated or decussated, smooth below, shining; whirls 6–7, gradually increasing; aperture oblique, lunar; peristome straight, acute, lightly labiate within.

Zonites newberryana,. W. G. BINN.—Shell broadly umbilicated, orbicularly depressed, solid, lightly decussated by incremental striæ, and numerous fine spiral lines; color black or reddish-brown, under the epidermis white and shining; suture deeply impressed; spire depressed; whirls six, regularly increasing, the upper ones flattened, the last convex, rounded below, and slightly deflected at the aperture; umbilicus broad, shewing all the volutions clearly; aperture oblique, transversely-lunar; in young specimens the decussated sculpturing of the shell on the parietal wall of the aperture is covered with a light callus as the animal grows, and elegantly marked with numerous fine, crowded, spiral lines; in mature specimens this beautiful marking is entirely obliterated by the deposition of callus, but on breaking the shell, the lines will be found to exist within; peristome simple, acute, thickened within, ends slightly approximated, joined by a white callus. Greater diam. 37, lesser 20; height 13 mill.

Fig. 504.



Zonites newberryana.

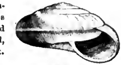
Helix newberryana, W. G. BINNEY, Proc. Acad. Nat. Sci. Phila. 1858, 115; Terr. Moll. IV, 20, pl. lxxvi, f. 7.—PFEIFFER, Mal. Blatt. 1859, 7.
Macrocyclis newberryana, TRYON, Am. Journ. Conch. II, 244, pl. iii, f. 5 (1866).

San Diego, California, and lately catalogued by Dr. Newcomb from the Temescal Mountains, near Los Angelos.

Cat No	No. of Sp.	Locality.	From whom received.	Remarks.
6561	5	San Diego, Cal.	Lieut. Ives.	Cab. series.

Zonites cultellata, Thomson.—Shell orbicular, depressed, carinated, shining, reddish horn-color, with a broad revolving band of white at the periphery and sutures; whirls six and a half, rather convex, decussated by minute lines of growth and microscopic revolving lines; below, these lines are obsolete, the surface is shining, whitish, with a broad reddish horn-colored band below the carina; suture impressed; aperture oblique, lunate; peristome acute, not thickened and scarcely reflected at the umbilicus, which is broadly expanded, and shows all the volutions to the apex. Greater diam. 35, lesser 19; height 13 mill.

Fig. 505.



Zonites cultellata.

Helix cultellata, Thomson, MS., W. G. Binney, Terr. Moll. IV, 22, pl. lxxvi, f. 6; Proc. Acad. Nat Sci. Philad. 1857, 185.—Pfeiffer, Mon. Hel. Viv. IV, 347.

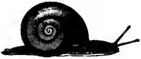
The shell from which the description and figure were drawn was sent me by Mr. J. H. Thomson from Contra Costa County, California. The fact of no other specimens having been found, and the strong resemblance of the shell to species of the European group of *Z. albanica* and *acies*, have thrown doubt upon its being really an inhabitant of California.

Subgenus OMPHALINA, Raf.

Shell umbilicated or perforate, depressed orbicular, striated above, shining and smooth below, sometimes uniformly smooth; last whirl dilated, not descending; aperture broad, ovate; peristome simple, straight, margins converging.

Animal (of *Z. fuliginosa*) nearly twice as long as the diameter of the shell, blackish, or bluish-black, darkest on the head, neck, and eye-peduncles. Eye-peduncles short in proportion to the length of the animal, and set widely apart. Respiratory foramen in the angle formed by the junction of the peristome with the body-whirl. Base of foot whitish, the locomotive band defined by two very fine lines, or furrows. A double, marginal furrow runs along the sides of the foot, from the head nearly to the posterior extremity,

Fig. 506.



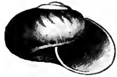
Animal of *Zonites fuliginosa.*

where it passes upward, and joins that from the opposite side, leaving posteriorly a flattened, rounded extremity, somewhat prominent and glandular. Upon the centre of the extremity is a longitudinal fissure, or sinus, which is sometimes expanded, and at other times closed and invisible. Secretion of mucus from the extremity profuse.

I have adopted Rafinesque's name *Omphalina*[1] for this subgenus, because the presence of the mucus pore requires a distinction between the following species and those of *Mesomphix*, to which they are usually referred. Where the pore is not considered a generic distinction the species here grouped will be considered as belonging to *Mesomphix*, a subgenus of *Hyalina*.

Zonites kopnodes, W. G. BINN.—Shell depressed globose, wrinkled, below smooth; spire short, depressed; suture moderate; whirls five, rapidly increasing, the last very ventricose and large, sometimes marked with coarse revolving lines; aperture large, round, peristome simple, acute, ends approached, joined by a slight deposition of brownish callus over the parietal wall, reflected at the small and deep umbilicus. Greater diam. 35, lesser 28; height 13 mill.

Fig. 507.



Zonites kopnodes.

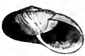
Helix kopnodes, W. G. BINNEY, Proc. Acad. Nat. Sci. Philad. 1857, 186; Terr. Moll. IV, 104, pl. lxxx, f. 14.—PFEIFFER, Mon. Hel. Viv. IV, 346.

Hyalina kopnodes, TRYON, Am. Journ. Conch. II, 248, pl. lv, f. 21 (1866).

Found in Georgia, Alabama, and Tennessee in the Cumberland Mountains.

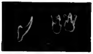
A variety from Columbus, Georgia, and Franklin County, Tennessee, is more depressed, and has longitudinal striæ on the upper surface like *Z. lævigata* (Fig. 508).

Fig. 508.



Zonites kopnodes, var.

Fig. 509.



Lingual dentition of *Zonites kopnodes*.

The lingual membrane is very broad,

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[1] See p. 67 of ed. Binney and Tryon.

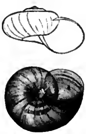
has 70 rows of ninety-three long, slender teeth (46—1—46). Centrals tricuspid, laterals bicuspid, uncini aculeate and curved.

Animal dirty white, the granules sometimes marked by a darker color, running into a light fawn color on the top of back near the head; eye-peduncles and tentacles darker; upper part of tail is also a slight slate-color, darker below the furrows. The breadth of the animal is very much greater than in most of our species, the head broader, blunter, the eye-peduncles shorter, heavier, and very much more widely set apart. A narrow locomotive disk below. Along the side of the foot, parallel to the base, are two furrows, rather darker in color, running upwards towards the tail, and meeting on its upper surface, above a mucous pore. The extremity of the tail broad and flattened, spade-like, usually curved at its point when the animal is in motion. The animal is more sluggish and less sensitive to touch than the other species. Its labial tentacles are highly developed, being nearly as long as the lower feelers. Measurements of an individual in motion: Extreme length of foot 59, before shell 16, behind shell 14, of shell on back 32, of tentacles 10; breadth of head 11 mill.

Cat. No.	No. of Sp.	Locality.	From whom received	Remarks.
8676	2	Alabama.	W. G. Binney.	Cab. series.

Zonites fuliginosa, Griff.—Shell thin, depressed on the upper surface, epidermis dark, approaching to chestnut-color, shining and smooth, wrinkled; whirls four and a half, rapidly increasing, with irregular, oblique wrinkles, the last whirl very voluminous, and expanding transversely towards the aperture; suture very little impressed: aperture very oblique, ample, lunate-ovate, within pearly or iridescent; peristome simple, thin, brittle, with a light, testaceous deposit within, the two terminations approaching each other very nearly, that of the columella somewhat reflected; umbilicus deep, not much expanded. Greater diam. 26, lesser 22; height 13 mill.

Fig. 510.



Zonites fuliginosa.

Helix fuliginosa, Griffith, in letters; Binney, Terr. Moll. II, 222, pl. xxxi; Bost. Journ. Nat. Hist. III, 417, pl. xxiv, excl. syn. (1840).—Leidy, T. M. U. S. I, pl. ix, f. 4 (anat.).—Adams, Shells of Vermont, 161, excl. syn. (1842).—DeKay, N. Y. Moll. 37, pl. iii, f. 22 (1843).—Pfeiffer, Mon. Hel. Viv. I, 88; in Chemnitz, ed. 2, II, 104, pl. lxxxiv, f. 1-3.—Reeve, Con. Icon. 675 (1852).—W. G. Binney, Terr. Moll. IV, 105.—Morse, Amer. Nat. I, 315, f. 23, 24 (1867).

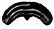
Helix capillacea, Pfeiffer, Symbolæ, II, 24, not Fér., teste Pfr.

Omphalina cuprea, Rafinesque, Enum. and Acc. 3; ed. Binney and Tryon, p. 67.

Hyalina fuliginosa, Tryon, Am. Journ Conch. II, 248, pl. iii, f. 16 (1866).

Has been found in nearly all the Northern, Western, Middle, and some of the Southern States. In one case I have known of its being found at the northern side of Lake Superior. Also in Canada.

Fig. 511.



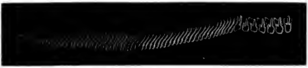
Jaw of *Zonites fuliginosa.*

Animal (see p. 283).

Jaw very arcuate, of almost uniform breadth, ends blunt; anterior surface with transverse striæ; concave margin simple, with a well-developed, blunt, median projection.

Lingual membrane very broad, composed of 87 rows (64—1—64) of one hundred and twenty-nine long slender teeth each; centrals tricuspid, laterals 10, bicuspid, in a straight transverse row; uncini curved, aculeate, in a somewhat diagonal row.

Fig. 512.

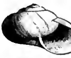


Lingual dentition of *Zonites fuliginosa.*

Cat. No	No. of Sp.	Locality.	From whom received.	Remarks.
7929	1	Marietta, Ohio.	W. Holden.	......
8596	2	....	W. G Binney.	Cab. series.
8749	3	Pennsylvania.	W. Stimpson.	......

Zonites caduca, Pfr. — Shell umbilicated, depressed, fragile, shortly striate, white with a reddish horn-colored epidermis; spire slightly elevated, apex delicate; whirls five and a half, rather convex, the last much broader, rather flattened below, excavated around the tunnel-like, minutely closed umbilicus; aperture large, obliquely oval; peristome simple, thin, with ends approaching, joined with a very light callus, the columellar one scarcely broadened. Greater diam. 27, lesser 22; height 14 mill.

Fig. 513.



Zonites caduca.

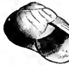
Helix caduca, Pfeiffer, Mon. Hel. Viv. I, 89, &c.—Reeve, Con. Icon. 530.—W. G. Binney, Terr. Moll. IV, 105.

Hyalina caduca, Tryon, Am. Journ. Conch. II, 248, pl. iii, f. 15 (1866).

Admitted in the catalogue on the authority of Pfeiffer (Roëmer's Texas, 455), who quotes it from New Washington. It is a Mexican shell: a specimen from that locality is figured (Fig. 513).

Zonites friabilis, W. G. Binn.—Shell very globose, transparent, brittle, thin, sometimes thick, shining, reddish; spire very short, conic; whirls five, convex, lightly wrinkled, rapidly increasing, the last very large and ventricose; suture moderate; aperture circular, equally high and broad, within bluish and slightly thickened by a very thin white callus; peristome simple, sharp, thin, at its junction with the body-whirl violet-colored and reflected, so as to cover a portion of the small and deep umbilicus; the parietal wall of the aperture is covered with a light violet-colored callus. Greater diam. 26, lesser 20; height 13 mill.

Fig. 514.



Zonites friabilis.

Helix friabilis, W. G. Binney, Proc. Acad. Nat. Sci. Phila. 1857, 187; Terr. Moll. IV, 106, pl. lxxx, f. 2.—Pfeiffer, Mon. Hel. Viv. IV, 346.—Bland, Ann. N. Y. Lyc. VII, 126.

Helix lucubrata, Pfeiffer, Mon. Hel. Viv. IV, 68; Mal. Blatt. 1858, 32, not of Say.[1]

Hyalina friabilis, Tryon, Am. Journ. Conch. II, 247, pl. iii, f. 12 (1866).

Indiana, Illinois, Alabama, Arkansas, Texas. The specimens from the first two States only deserve the specific name, the other localities furnishing quite thick shells.

Cat. No	No. of Sp.	Locality.	From whom received.	Remarks.
8033	6	Texas.	Lieut. Couch.	......
8627	3	"	"	Cab series.
8816	6	"	W. G. Binney.	......
8939		Hot Springs, Ark.	Dr. B. Powell.	......

Zonites lævigata, Pfeiffer.—Shell somewhat convex, oftener depressed; epidermis greenish horn-color, shining, thin; whirls five, rather flattened, rapidly enlarging, with beautiful and regular oblique striæ and revolving microscopic lines; the last whirl expanding towards the aperture, not descending; aperture transverse, broadly lunar, ample, with a testaceous deposit within; peristome thin, acute, straight, extremities approaching, its lower extremity inserted into the centre of the base, and somewhat reflected; base smooth, perforate. Greater diam. 18, lesser 15; height 9 mill.

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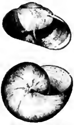
[1] *H. lucubrata*, Say, is not included in my work, being found beyond the geographical limits embraced.

Fig. 515.



Zonites lævigata.

Helix lævigata, Pfeiffer, Mon. Hel. Viv. I, 64; III, 67 (excl. syn.); in Chemnitz, ed. 2, II, 106, pl. lxxxiv, f. 17–19 (excl. syn.).—Reeve, Con. Icon. no. 672 (1852)?—Deshayes in Fér. I, 94, pl. lxxxii, f. 6.—W. G. Binney, Terr. Moll. IV, 106.—Bland, Ann. N. Y. Lyc. VII, 119 (excl. syn. *inornata*).

Helix lucubrata, Binney, nec Say, Terr. Moll. II, 225, pl. xxxii.

Helix fuliginosa, Binney, in Bost. Journ. (pars, excl. descr., syn., et fig.), 1840.

Helix inornata, Reeve, *l. c.* 666, not Say.

Hyalina lævigata, Tryon, Am. Journ. Conch. II, 247, pl. III, f. 12 (1866).

From Pennsylvania to Florida; from Arkansas to Illinois.

Fig. 516.

Zonites lævigata, var.

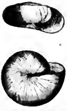
The shell described and figured above is well known in collections, and can be confounded with no other now known. It has, however, been peculiarly unfortunate in its synonymy, as a reference to the fourth volume of the Terrestrial Mollusks and the seventh volume of the New York Lyceum Annals will show.

A more globose variety is figured.

Cat. No	No. of Sp	Locality.	From whom received.	Remarks.
8038	1	....	......	......
8631	1	Georgia	W. G. Binney.	Cab. series.
8866	1	Columbus, Ga.	"	......

Zonites subplana, Binney.—Shell flattened, planulate above and beneath; epidermis brownish or smoky horn-color, shining; whirls five and a half, those nearest the apex striated transversely with very minute and delicate wrinkles; suture distinct, not much impressed; aperture transverse, not expanded, the plane of the aperture making nearly a right angle with the plane of the base of the shell; peristome simple, thin, acute; base flattened, umbilical region a little impressed; umbilicus small, round, and deep, not exhibiting the volutions. Greater diam. 20, lesser 16; height 6 mill.

Fig. 517.



Zonites subplana.

Helix subplana, Binney, Bost. Journ. Nat. Hist. IV, part 1, cover, p. 3 (1842); IV, 241 (1842); Terr.

Moll. II, 229, pl. xxxii.—Pfeiffer, Mon. Hel. Viv. I, 112.—W. G. Binney, Terr. Moll. IV, 110.

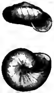
Hyalina subplana, Tryon, Am. Journ. Conch. II, 250, pl. iv, f. 23 (1866).

Eastern Tennessee and Pennsylvania, in mountainous regions.

The only American species which this shell can be said to resemble is *Z. inornata*, which in size and color is quite like it, and at first sight may be taken for it. It differs from it in the following particulars: The upper and lower surfaces are both more flattened, and the outline is a more perfect circle. The number of whirls, in specimens of the same size, is greater by nearly one volution. The surface of the whirls is less rounded; the last whirl expands but very little towards the aperture; the base is broader, less indented, and very flat; the umbilicus is rounder, and better defined; and the aperture is not thickened within, by a white, testaceous deposit.

Zonites inornata, Say.—Shell depressed; epidermis yellowish horn-color, smooth, shining, with very minute lines not breaking the smoothness of the surface; whirls five; suture not much impressed; aperture transverse, scarcely oblique, obliquely-lunar, with a thick, white, testaceous deposit around its whole inner surface, a little distant from the margin; peristome thin, acute, fragile, its ends somewhat converging, the columellar margin reaching to the centre of the base, subdilated above; umbilicus small; base rather flattened, indented in the centre. Greater diam. 16, lesser 12½; height 6 mill.

Fig. 518.



Zonites inornata.

Helix inornata, Say, Journ. Acad. Nat. Sci. Philad. II, 371 (1821); Binney's ed. 24.—Binney, Bost. Journ. Nat. Hist. III, 419, pl. xxi, f. 3 (1840); Terr. Moll. II, 227, pl. xxxiv.—DeKay, N. Y. Moll. 39 (1843).—Adams, Vermont Mollusca, 161 (1842).—Pfeiffer, Mon. Hel. Viv. I, 84; IV, 48.—W. G. Binney, Terr. Moll. IV, 109.—Morse, Amer. Nat. I, 314, f. 19, 21, 22 (1867).

Helix glaphyra, Pfeiffer, olim, Symbolæ, II, 29, excl. syn. *fuliginosa*; Mon. Hel. Viv. I, 57.—Reeve, Con. Icon. 667.—Not Say.

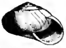
Helix inornata, Binney, not Say, Bland, Ann. N. Y. Lyc. VII, 127.

Hyalina inornata, Tryon, Am. Journ. Conch. II, 249, pl. iv, f. 22 (1866).

From North Carolina to Kentucky through the States bordering on the great lakes. In the western parts of New England it is found, but very rarely.

Animal with head, neck, and eye-peduncles bluish-black; foot whitish. Eye-peduncles long and slender. A marginal furrow extending along the edges of the foot, and uniting above and before its posterior termination. Behind the junction is a prominent, subconical, bluish-white gland, on the extremity of the foot.

Fig. 519.



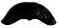
Zonites inornata, var.

Fig. 518 represents the usual form of the species. A more globose form is figured in Fig. 519. It was found in the mountains near Ashville, Buncombe County, North Carolina, by Dr. Ravenel.

The shell which is described above is well known in collections, and not easily confounded with any other. It has been unfortunate in its synonymy, whose history is treated at length and explained in the fourth volume of the Terrestrial Mollusks and Annals of New York Lyceum quoted above.

I have in my collection a curious specimen from the Pennsylvania mountains in which are three well-developed sharp tooth-like processes on the internal thickened margin of the peristome.

Fig. 520.

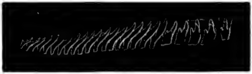


Jaw of *Zonites inornata*.

Jaw strongly arcuate, ends rapidly attenuated; anterior surface striated; concave margin smooth with an acute median projection.

Lingual membrane with 37 rows of forty-seven (23—1—23) teeth each; centrals long, slender, tricuspid; laterals eight only, stouter, bicuspid; uncini aculeate and curved.

Fig. 521.

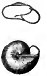


Lingual dentition of *Zonites inornata*.

Cat No.	No. of Sp.	Locality.	From whom received.	Remarks.
8673	2	....	W. G. Binney.	Cab. series.
8733	5	Western States.	W. Stimpson.	......
8761	2	Ohio.	"	......

Zonites sculptilis, BLAND.—Shell scarcely perforate, suborbicular, depressed, subpellucid, pale horn-color above, of lighter shade beneath, shining, with regular, subequidistant, impressed transverse lines, those on the last whirl extending over the periphery, and converging in the umbilical excavation; spire very little elevated, scarcely convex; whirls seven, planulate, the last rapidly increasing, equal at the aperture to one-third the diameter of the shell, beneath flattened, and little excavated in the umbilical region; suture lightly impressed; aperture scarcely oblique, depressed, transverse, lunate; peristome simple, acute, sinuate, the columellar margin very rapidly and narrowly reflected over, and almost entirely covering the very small perforation. Greater diam. 12½, lesser 11; height 5 mill.

Fig. 522.



Zonites sculptilis.

Helix sculptilis, BLAND, Ann. N. Y. Lyc. VI, 279, pl. ix, f. 11–13 (1858).—W. G. BINNEY, Terr. Moll. IV, 110, pl. lxxvii, f. 15.—PFEIFFER, Mal. Blatt. 1859, 5.

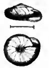
Hyalina sculptilis, TRYON, Am. Journ. Conch. II, 249, pl. iii, f. 18 (1866).

Anantehely Mountains, North Carolina.

In sculpture it is closely allied to *Hyalina indentata*, of which it might almost be termed a gigantic variety, but the impressed striæ are more numerous, and closer together. The form of the aperture is very near that of *Z. inornata*.

Zonites elliotti, REDFIELD.—Shell with rather a narrow umbilicus, depressed-orbiculate, with fine transverse striæ, greenish horn-colored, hardly translucent, shining beneath; spire convex but not much raised; whirls five, rather convex, last one sometimes very slightly depressed at the aperture; suture deeply impressed; aperture very oblique, lunate-circular; peristome a little sinuate, acute, but thickened within. Greater diam. 9, lesser 8; height 4 mill.

Fig. 523.



Zonites elliotti.

Helix elliotti, REDFIELD, Ann. N. Y. Lyc. VI, 170, pl. ix, f. 8–10 (1856).—GOULD, Terr. Moll. III, 23.—W. G. BINNEY, Terr. Moll. IV, 116, pl. lxxvii, f. 18.

Macrocyclis elliotti, TRYON, Am. Journ. Conch. II, 246, pl. iii, f. 10 (1866).

Mountains of Georgia and North Carolina.

Animal with a distinct caudal mucous pore.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8676	3	Georgia.	W. O. Blaney.	Teste Redfield. Original lot. Cab. ser.

Subgenus VENTRIDENS.

Shell subperforate or umbilicated, orbicularly convex, diaphanous horn-color; glassy, more or less wrinkled; whirls 5–7; aperture lunar, almost always furnished at its base with fold-like denticles not reaching the margin; peristome simple, acute. Animal with a caudal mucus pore.

Animal (of *Z. suppressa*) bluish-black, darker on the head, eye-peduncles, and neck; eye-peduncles long and filiform, tentacles short. Length twice the diameter of the shell. On the upper surface of the extremity of the foot is a longitudinal fissure or furrow, from which mucus exudes in great quantities, and which the animal shuts and closes at will.

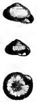
Fig. 524.

Tail of *Zonites suppressa*, enlarged.

The species comprising the group for which I propose the name *Ventridens* are distinguished by the caudal mucus pore only from those of the subgenus *Gastrodonta*.

Zonites gularis, Say.—Shell subperforated, subconical; epidermis shining, pale yellowish horn-color; spire sometimes tending to a point, at other times obtuse; whirls seven or eight, very minute at the apex, increasing in diameter regularly and gradually, until they reach the aperture, with strongly marked, curved wrinkles; suture impressed and distinct; aperture transverse, not much expanded; peristome simple, thin at its edge, within thickened with a white, testaceous deposit; base flat, indented in the centre, near the aperture yellowish-white and opaque; umbilicus small and rounded in young shells, obsolete or diminished to a mere point in older ones; within the base of the aperture are one or two lamelliform, elongated, nearly parallel teeth, one near the base, the other more central. Greater diam. 8, height 5 mill.

Fig. 525.



Zonites gularis.

Helix gularis, Say, Journ. Acad. Nat. Sci. Philad. II, 156 (1822); Binney's ed. 18.—Binney, Bost. Journ. Nat. Hist. III, 408, pl. xi, f. 1 (1840); Terr. Moll. II, 251, pl. xxxvii, f. 3, 4.—DeKay, N. Y. Moll. 46 (1843).—Férussac, Hist. pl. li, a, f. 4 (?).—Pfeiffer, Mon. Hel. Viv. I, 183, excl. β; Symbolæ, II, 29, excl. β; in

Chemnitz, ed. 2, II, 201, tab. ci, f. 5–8.—W. G. Binney, Terr. Moll. IV, 122.—Mrs. Gray, Fig. Moll. An. pl. cxci, f. 4, ex Bost. Journ. —H. & A. Adams (*Gastrodonta*), Gen. Rec. Moll. pl. lxxi, f. 4 (no descr.).—Reeve, Con. Icon. no. 719 (1852).

Helix bicostata, Pfeiffer, Mon. Hel. Viv. I, 182; Symbolæ, III, 697 (1852); in Chemnitz, ed. 2, II, 196, pl. o, f. 21–23 (1846).—Reeve, *l. c.*

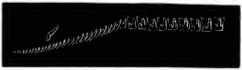
Gastrodonta gularis, Tryon, Am. Journ. Conch. II, 257, pl. iv, f. 39 (1866).

It is found from Pennsylvania and Ohio to the Gulf of Mexico. Also in the postpleiocene of the Mississippi Valley.

There is a variety with an open umbilicus.

Lingual membrane with 88 rows of (38—1—38) teeth each; centrals with one long central and two short lateral cusps; laterals bicuspid; uncini thorn-shaped.

Fig. 526.



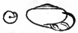
Lingual dentition of *Zonites gularis*.

Tail with a mucus pore.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8682	6	Alabama.	W. G Binney.	Cab. series.
8683	9	Georgia.	Dr. J Lewis.	"
8757	4	Ohio.	W. Stimpson.	......

Zonites suppressa, Say.—Shell convex depressed, thin, pellucid; epidermis polished, yellowish horn-color; spire flat; whirls six, with crowded, minute, oblique striæ; suture impressed, distinct; aperture transverse, not expanded; peristome simple, thin at its edge, thickened within; base rather convex, near the aperture opaque, yellowish-white; umbilicus small, but rounded and distinct, in young shells, obsolete or hardly apparent in older ones; within the peristome are one or two lamelliform, elongated, oblique teeth. Greater diam. 5, lesser 4; height 2 mill.

Fig. 527.



Zonites suppressa.

Helix suppressa, SAY, New Harm. Diss. II, 229 (1829); Descr. 14; BINNEY'S ed. 36.—BINNEY, Bost. Journ. Nat. Hist. III, 410, pl. xi, f. 3; Terr. Moll. II, 253, pl. xxxvii, f. 1.—DEKAY, N. Y. Moll. 38, pl. iii, f. 24 (1843).—REEVE, Con. Icon. 723.—W. G. BINNEY, Terr. Moll. IV, 122.—MORSE, Amer. Nat. I, 411, f. 25 (1867).—PFEIFFER, Mon. Hel. Viv. IV, 153.

Helix gularis, var. β, PFEIFFER, in CHEMNITZ, ed. 2, &c. See *Z. gularis.*

Gastrodonta suppressa, TRYON, Am. Journ. Conch. II, 258, pl. iv, f. 41 (1866).

Fig. 528.

Jaw of *Zonites suppressa.*

Animal (see p. 292).

Jaw strongly arcuate, ends rounded, anterior surface striated; concave margin smooth, with a stout, rounded, blunt, median projection.

From Florida to New England.

Cat No.	No. of Sp.	Locality.	From whom received.	Remarks.
7943	2	Washington, D. C.	W. Stimpson.	......
8586	2	Pennsylvania.	W. G Binney.	......
8758	3	Western States.	W. Stimpson.	......
8787	2	Ohio.	......	......

β. Mantle covering the whole of the back. Respiratory chamber small, thin, in the front of the body, separate from the mantle. Head without any grooves. Eye-peduncle and tentacle distinct.

FAMILY PHILOMYCIDÆ.

Lingual membrane very broad, teeth uniform, in numerous close, straight, transverse rows, the central large, obtusely conical, broad, laterals the same, the inner ones surmounted by a pointed apex.

Jaw horny, arcuate, strongly striated, its extremities blunt, concave margin irregular, scarcely bluntly projecting in the centre, vertically convex in the middle.

Animal limaciform, elongated, tapering behind. Eyes at the end of retractile cylindrical peduncles; tentacles short. Mantle thin, large, entirely covering the back. Respiratory orifice on the right side near the head, above the edge of the mantle. Foot narrow, elongate, simple posteriorly, extending beyond the mantle; no locomotive disk. Vent a little above and before the respiratory orifice. Male and female organs with the same orifice, behind and below the right eye-peduncle.

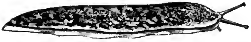
No internal shell.

The Asiatic genus *Meghimatium* is also referred to this family, it being by some considered identical with the strictly American genus *Tebennophorus.*

TEBENNOPHORUS, Binn.

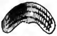
Body somewhat flattened, terminating obtusely, or in a somewhat truncated form. Back convex, more flat when fully extended. Integuments with irregular vermiform glands, anastomosing with each other, and having a general longitudinal direction. Mantle covering the whole body. Locomotive disk expanded at its margin, and visible beyond the sides of the mantle; no median band. Respiratory orifice near the head. Anal orifice contiguous to, and a little above and in advance of the pulmonary orifice. Orifice of organs of generation behind and below the eye-peduncle. Without terminal mucus pore.

Fig. 529.



Tebennophorus carolinensis.

Fig. 530.

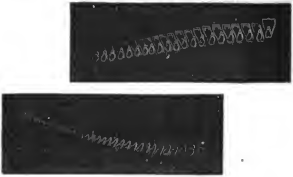


Jaw of *Tebennophorus carolinensis.*

Jaw horn-colored, arcuate, with a slightly denticulated or irregular concave margin, bearing a blunt, slightly projecting beak, terminations blunt; the anterior face is convex, without a decided median carina, and strongly striate.

The lingual membrane is very broad, composed of teeth of a short, conical form, the centrals symmetrical and smaller, the laterals inclined towards the central; apex of each sharper.

Fig. 531.



Lingual dentition of *Tebennophorus carolinensis*.

The internal rudimentary, nail-like shell described by Dr. Gray, has not been noticed by any American author.

The habits of the genus are similar to those of the native species of *Limax*.

Beside the two species found in this country one has been described from Costa Rica by Mörch (Mal. Blatt. VI, 110).

This genus was first described, in 1842, by Binney (Bost. Journ. Nat. Hist. IV, 163), under the name of *Tebennophorus*. No other descriptions of it have been published. The three species of it have been referred by various authors to other genera, such as *Limax*, which differs in having a small shield-like mantle, a different shaped jaw, &c.; and to *Philomycus*, a genus distinguished by the absence of a mantle. The latter genus probably existed only in the fertile imagination of Rafinesque, the same "habitat" where flourished *Tremesia* and *Deroceras*.[1]

Ferussac repeats (1823) the description of Rafinesque, but never had seen an individual of the genus. He suggests that *Limax carolinensis*, Bosc, may belong to it, judging from the figure alone. Gray, H. & A. Adams, and Mörch adopt the name of *Philomycus*, on the supposition that Rafinesque had before him a *Tebennophorus* when describing *Philomycus* (in 1820). It may be he had, but as he did not make it so appear, I have preferred adopting the first name evidently applying to it.

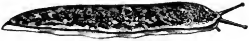
---

[1] See descriptions of these singular animals in the new edition of Rafinesque's Complete Conchological Writings. Baillière, New York, 1864. See also Terr. Moll. I, 51, 52.

Meghimatium, or *Incillaria*, an Asiatic genus, is by some considered identical with *Tebennophorus*.

Tebennophorus carolinensis, Bosc.—Color of upper surface whitish, or yellowish-white, variegated with clouds and spots of brownish and blackish, so arranged as to form three ill-defined longitudinal bands, one on the centre of the back, and one on each flank, extending from the head to the posterior extremity, anastomosing more or less with each other, and having smaller spots of the same color between them; inferior margin white, or yellowish; foot whitish. Mouth surrounded with a circular row of papillæ. Body elongated, subcylindrical, flattened towards its posterior extremity, which is obtuse; eye-peduncles one-fourth of an inch long, brownish or blackish, stout, terminating in a bulb; ocular points on the superior part of the bulb; tentacles immediately below the eye-peduncles, white, very short, nearly conical. Mantle fleshy, covering the whole body, its anterior edge tinged with brownish, and falling in a slight curve between the two eye-peduncles, reaching on the sides to the margin of the foot; posterior extremity rounded; cuticle covered with irregular vermiform glands, anastomosing with each other, and having a general tendency to a longitudinal direction, with shallow furrows between, lubricated with a watery mucus, and susceptible of contractions which produce a slow, undulatory motion, like the flowing of water, over the whole surface. Foot whitish, extending a little beyond the mantle posteriorly, showing a whitish flattened border. Orifice of the organs of generation on the right side, at a little distance behind and below the eye-peduncles. Respiratory orifice large, on the right side, one-fourth of an inch behind the origin of the eye-peduncle; anal orifice in close contact, a little above and in front of it; above the respiratory orifice, on the

Fig. 532.



Tebennophorus carolinensis.

back, is a deep curved furrow, running upwards and backwards. Locomotive band not distinguished from the lower surface of the foot. Greatest length, when fully extended, 100 mill.; ordinary length 75.

- *Limax carolinensis*, Bosc, Vers de Buffon de Deterville, 80, pl. iii, f. 1. —Ferussac, Hist. 77, pl. vi, f. 3.—Deshayes, in Lam. 2d ed. VI, 719; ed. 3, III, 264 (1839).—Mrs. Gray, Fig. Moll. An.
- *Limax carolinianus*, De Roissy, Buffon de Sonnini, V, p. 185 (An XIII).
- *Limax togata*, Gould, Inverteb. Mass. 3 (1841).
- *Philomycus carolinensis*, Ferussac, Tab. Syst. 15.—Pfeiffer, Brit. Mus. Cat. 158.—H. & A. Adams, Gen. II, 220.—Chenu, Man. de Conch. I, 469, f. 3479 (1859).
- *Tebennophorus carolinensis*, Binney, Bost. Journ. Nat. Hist. IV, 171 (1842); Terr. Moll. II, 20, pl. lxiii, f. 1, 2.—Adams, Shells of Vermont, 163 (1842).—DeKay, N. Y. Moll. 24, pl. iii, f. 1 (1843).—Wyman, Bost. Journ. Nat. Hist. IV, 410, pl. xxii (1844), anat.—Leidy, T. M. U. S. I, 250, pl. iii (1851), anat.—W. G. Binney, Terr. Moll. IV, 3.—Morse, Journ. Portl. Soc. I, 7, f. 3; pl. iii, f. 4 (1864).
- *Limax marmoratus*, DeKay, Cat. N. Y. An. 31, no descr. (1839).—Linsley, Shells of Conn., Sill. Journ. [1] XLVIII, 279, no descr.

From Canada to Texas.

In this species the head never projects beyond the mantle. The tentacles and eye-peduncles are contractile and retractile, as in the other slugs. When handled it secretes from the skin a thick, milky, adhesive mucus. Small individuals suspend themselves by a thread. We have noticed its posterior extremity curved upwards when the animal was in motion; at other times flattened and expanded, and again very much corrugated, and apparently truncated; sometimes there *appear* to be one or more mucous glands at this part, and the secretion of mucus from it is more plentiful than from other parts of the body. The mantle is not cleft from the respiratory foramen to the margin, as in most of the slugs, but is provided with a deep furrow or canal running from the orifice to the edge of the mantle below it.

It is very inactive and sluggish in its motions. It inhabits forests, under the bark, and in the interior of the decayed trunks of fallen trees, among which it is particularly partial to the Bass-wood, *Tilia Americana*.

The variations from the common coloring are numerous. We have already observed the following varieties:—

a. Whitish, without clouded spots, tending to grayish.

b. Whitish, slightly clouded longitudinally.

c. Irregularly clouded with brownish, without any tendency to longitudinal arrangement.

d. With three distinct rows of large clouded spots.

e. With great numbers of fine black spots.

f. Gray, with a line of minute black dots along each side.

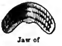
g. Blackish-gray, with black lines along each side, and an indistinct line down the middle of the back.

The appearance of the surface of the mantle is constantly changing, from the play of light on its lubricated eye-peduncles, tentacles, and furrows, which are in almost ceaseless motion.

There can be no doubt that this is the animal originally described by Bosc under the name of *Limax carolinensis*, though his description is so imperfect that it can only be recognized by the arrangement of colors which belongs to it. His original drawing, engraved in Ferussac's work, is a tolerably accurate representation of one of its varieties. He makes no mention of the mantle, and it does not appear in the figure.

An individual of this species kept in confinement, deposited about thirty eggs, June 20, 1843; on the 10th July the young made their way out of the shell. The eggs were semi-transparent, oval, about one-fifth of an inch in the greatest diameter. The young when excluded were more than a fourth of an inch long, semitransparent and gelatinous; eye-peduncles and tentacles bluish-black at base, black at tip, the latter very minute and hardly visible. Body broad; back whitish, with two distinct rows of minute black dots down the middle, and other scattering spots on the sides. No perceptible furrow between the mantle and body. They increased very rapidly in size, and in a few days were four times as large as when hatched.

Fig. 533.

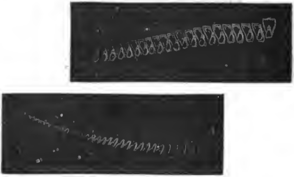


Jaw of *Tebennophorus carolinensis.*

Jaw short, broad, arched, light horn-colored; anterior surface convex, but having no distinct vertical carina on the centre, its most anterior point. Concave margin irregular, without a distinct acute median projection, though sometimes bluntly prominent. Extremities attenuated. The whole anterior surface covered with converging vertical striæ and arched striæ.

Lingual membrane with 115 rows of one hundred and thirteen teeth each (56—1—56); centrals conical, surmounted by a sharper point; laterals of the same shape, but narrower, becoming modified into bicuspid and papillæ-like uncini.

Fig. 534.



Lingual dentition of *Tebennophorus carolinensis.*

Of the synonyms I have quoted, *Limax togata* is said by Gould (Otia, 182) to be identical; and *Limax marmoratus*, of DeKay, I have ascertained to be the same from the correspondence of my father with Dr. Newcomb.

Cat. No.	No. of Sp.	Locality.	From whom received.	Remarks.
8471	5	Middle States.	......	Alcohol.
6578	1	....	W. G. Binney.	Cab. series.

Tebennophorus dorsalis, BINNEY.—Color of upper surface ashy, with a shade of blue, an interrupted black line extending down the centre of the back; eye-peduncles black, about one-eighth of the length of the body; tentacles blackish, very short. Body cylindrical and narrow, terminating posteriorly in an acute point; base of foot white, very narrow, its separation from the body not well defined. Upper surface covered with elongated and slightly prominent glandular projections, the furrows between indistinct. Respiratory orifice very minute, situated on the right side, about one-eighth of an inch behind the insertion of the eye-peduncle. The mantle is closely connected with the body. Length 18 mill.

Fig. 535.

Tebennophorus dorsalis.

Philomycus dorsalis, Binney, Bost. Journ. Nat. Hist. IV, 174 (1842); Proc. Bost. Soc. Nat. Hist. 1841, 52.—Adams, Shells of Vermont, 163 (1842).—Gray & Pfeiffer, Brit. Mus. Cat. 159.

Limax dorsalis, DeKay, N. Y. Moll. 22 (1843).

Tebennophorus dorsalis, Binney, Terr. Moll. II, 24, pl. lxiii, f. 3 (1851).—W. G. Binney, Terr. Moll. IV, 31.

Pallifera dorsalis, Morse, Journ. Portl. Soc I, 8, f. 5; pl. iii, f. 6 (1864).

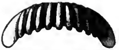
Vermont and Massachusetts.

This animal is found in woods and forests, in the soil under decaying trunks and logs. It is lubricated by a watery mucus which is not secreted in quantity sufficient to preserve its life when removed from its native haunts and exposed to the air. It is even difficult to preserve it long enough for examination, as it becomes dry, diminishes in bulk more than one-half, and dies. We have seen but three specimens. They were very active in their movements, and one of them suspended itself by a thread of mucus, in the manner of the *Limaces*. Our specimens were found in Vermont. Dr. Gould has recognized this or a similar species near Boston.

It is quite possible that this is one of the species described by Rafinesque, but from the poverty of his descriptions, we are unable to identify it with either of them.

When Dr. Binney for the first time procured this animal, not being able to distinguish the separation of the margin of the mantle from the edge of the foot, he felt assured that it must be a species of Rafinesque's genus *Philomycus*, and he accordingly described it as such. Having an opportunity since that time of examining several of them, he noticed, on throwing some of them into alcohol for preservation, that the contraction, caused by the liquor, revealed and detached the mantle from its adhesion. Its characters, therefore, correspond with those of the present genus. It is by no means certain, however, that it may not prove to be the young of the preceding species.

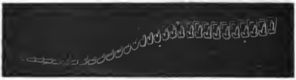
Fig. 536.



Jaw of *Tebennophorus dorsalis?*

Since the above was written, Morse has published (Journ. Portl. Soc. I, 8) a figure of the jaw and lingual membrane of this species which differ sufficiently from those of *T. carolinensis* to warrant its generic distinction. I have hesitated to adopt his name *Pallifera* until his observations shall be confirmed by others.[1] He describes the jaw as arcuate, ends rounded, blunt, anterior surface with stout costæ, strongly denticulating the concave margin. The lingual membrane he describes as composed of 115 rows of one hundred and thirteen teeth each (56—1—56); centrals tricuspid, laterals bicuspid, uncini with three or four cusps or serrate.

Fig. 537.



Lingual dentition of *Tebennophorus dorsalis ?*

Spurious Species of Tebennophorus, &c.

Tebennophorus bilineatus, Cart., United States, of Grateloup (Dist. Geog. p. 30), is unknown to me.

Philomycus quadrilus, *fuscus*, *oxyrus*, and *flexuolaris* of Rafinesque (see Terr. Moll. I, p. 51 and 52), and *Philomycus* (*Eumelus*) *lividus* and *nebulosus* are placed in the same genus as *Tebennophorus carolinensis* by Gray and Pfeiffer, Brit. Mus. Cat. They are unknown to me.

B. *Head, eye-peduncles, and tentacles simple, contractile.*

Teeth numerous, four-sided, close on the lingual membrane.

Family VERONICELLIDÆ.

Lingual membrane very broad, teeth uniform, in numerous close, straight transverse rows, the centrals small, the laterals large, conical, pointed.

Jaw (of *Veronicella floridana*) narrow, arched, ribbed. Animal limaciform, elongate-ovate. Mouth not furnished with a buccal veil. Eyes at the end of contractile peduncles; tentacles bifid, non-retractile. Mantle greatly extended, coriaceous, smooth, covering the back; orifice of respiratory sac on the right side under the mantle margin. Foot narrow, with a locomotive disk, simple posteriorly. Vent distinct, posterior. Orifices of reproductive organs widely separated; male organ behind the right eye-peduncle, female orifice midway on the right side beneath the mantle.

---

[1] The more so as he figures the jaw and tongue of an *Arion* for those of *Limax agrestis*. I have detected errors of my own of this kind, arising from incorrectly labelling extracted jaws and tongues.

Shell none.

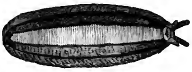
At present but one genus is known of this family, found also in South America, the West Indies, India, South Africa, and the Philippines.

The *Veronicellidæ* are most nearly allied to the *Onchidiidæ*, but are readily distinguished by their bifid tentacles. They are truly terrestrial, being found in damp places in the forests (see *Veronicella*).

VERONICELLA, Blainville.

Body oblong oval when contracted, more or less linear when extended; mantle covering the whole body; foot narrow, wrinkled transversely as if composed of numerous rings, simple posteriorly; head distinct, and capable of being retracted under the mantle; buccal mass with a jaw and with papillæ arranged around the mouth; tentacles two, bifid, unequal, contractile; eye-peduncles long and slender, annulated, obtuse and oculiferous at tip. Pulmonary cavity on the right side, at about two fifths the length of the animal, and opening, by means of a tube running along the side, at the posterior extremity, between the mantle and the free point of the foot, in company with the anal opening. Organs of generation separate and distant, the male organ pro-

Fig. 538.



Veronicella floridana.

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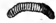
truding at the base of the right tentacle; the female opening about the middle of the right side. Mucus pore none.

Fig. 539.



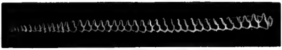
Jaw of *Veronicella floridana.*

Shell none.

Jaw slightly arcuate, long, narrow, with numerous ribs, margin pectinated.

Lingual ribbon (of *V. floridana*) very broad (48—1—48). Central teeth very small, triangularly-conical, acute; first twenty-nine laterals uniform, but decreasing in size as they pass off laterally, conical, acute, the base with a narrow lateral extension; the next fourteen comprised of a more obtuse denticle rising obliquely from the centre of the plate to which they are attached, without lateral extension; the balance becoming in form and size very much modified as they approach the margin.

Fig. 540.



Lingual dentition of *Veronicella floridana.*

There are but few known species of this genus, found in South America, the Philippines, South Africa, and the West Indies. Our single Florida species belongs rather to the fauna of South than North America.

The name *Vaginula*, sometimes used for the genus, was published several years after *Veronicella.*

The anatomy of *Veronicella* is given in vol. 1 of Terrestrial Mollusks U. S.

The contractility of the animal is very great. When extended it is very long and slender, and smooth or faintly reticulated, three or four times as long as when contracted; in which latter state it has an oblong form, equally rounded at both ends, and its surface is coarsely wrinkled, granular or tuberculated. The

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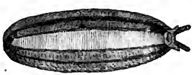
tentacles are generally bifurcate at tip, or rather there is a supplementary tentacle or spur, which can be protruded just short of the point of the tentacle; sometimes the tips are said to be even palmate.

It lives in families under stones and trunks of trees, and sometimes buried in the earth. It is capable of retiring from damp places, and sometimes inhabits very dry localities. It issues forth in the night and on wet days, when it may be found upon trees. Its movements are very rapid; no slimy traces are left behind them as in the case of the *Limaces*.

The eggs are large and oval, ten or fifteen being joined together in a necklace-like gelatinous thread, which is coiled and more or less covered with mucus.

Veronicella floridana, Binney.—Animal (contracted in alcohol) elongated oval, about four times as long as broad, the sides very slightly curved, and the extremities circularly rounded; back convex, regularly arched in every direction; surface very slightly wrinkled; color dark ashy gray, mottled with black, with a median whitish line, on each side of which, at about one-third the distance towards the margin, is an ill-defined stripe of black; beneath drab colored; foot occupying about one-third the width; eye-peduncles short, annulated, the tentacles not very distinctly bifurcate. Length 56, breadth 18 mill.

Fig. 541.

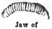


Veronicella floridana.

Vaginulus floridanus, Binney, Terr. Moll. II, 17, pl. lxvii (1851).—Leidy, T. M. U. S. I, 251, pl. iv, anat.

Veronicella floridana, Chenu, Man. de Conch. I, 472, f. 3501, 3502 (1859).

Fig. 542.

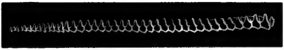


Jaw of *Veronicella floridana.*

Jaw arcuate, narrow, ends rounded, posterior surface with 24 ribs, crenulating the concave margin.

The jaw and lingual membrane have been figured and described on p. 304.

Fig. 543.



Lingual dentition of *Veronicella floridana.*

Has been found at a single locality, namely, at Charlotte Harbor on the west coast of Florida.

The above description is obviously very imperfect, inasmuch as it is drawn from a dead and greatly contracted specimen, and as no notes of the animal have been found excepting as to its locality. The characters, however, are sufficiently marked to distinguish the species. From its slight reticulation, in its contracted state, it must have been quite smooth when extended. Its colors are similar to those of *Tebennophorus carolinensis*, and similarly distributed. The tentacles are not very conspicuously spurred, but the puncture for the protrusion of a spur is manifest.

SPURIOUS SPECIES OF VERONICELLA.

The following species are catalogued by GRATELOUP among the American *Vaginuli* (Dist. Geog. des Limaciens, 22). They were all described by Rafinesque, and by him placed in his genus *Philomycus*. From the general inaccuracy of that author, as well as the deficiency of the descriptions, I think they should be excluded from this or any genus:—

Vaginulus flexuolaris,
Vaginulus fuscus,
Vaginulus oxyurus,
Vaginulus quadrilus.

FAMILY ONCHIDIIDÆ.

Lingual membrane broad; teeth uniform, similar, in numerous, straight, transverse rows; the centrals single, short, narrow, equilateral; the laterals numerous, nearly equilateral, with a broad, flat, subcentral tip. Mouth provided with a buccal veil.

No horny jaws.

Animal ovate, limaciform.

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Eyes at the end of non-retractile, cylindrical peduncles; tentacles none. Mantle coriaceous, large, shield-like, entirely covering the back; respiratory orifice posterior, at the right side, under the margin of the mantle. Foot narrow, elongate, simple posteriorly, with a locomotive disk. Vent separate from the respiratory orifice, posterior. Male organ under right eye-peduncle; female orifice at posterior extremity of body.

Shell none.

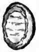
But few species of this family have been discovered. They are found to belong to several genera besides the one represented on our Pacific coast, and are variously distinguished by the characteristics of the mantle, smooth or granular in *Onchidella*, with arbusculiform tufts in *Peronia*, or with a large central tubercle and radiating striæ in *Buchanania*.

In their habits they are quite marine.

ONCHIDIUM, Buch.

Body oblong or oval, obtusely rounded behind, truncated before; mantle covering the whole body and reflected under the body, coriaceous, convex, tubercular; foot broad, simple posteriorly; mouth provided with papillæ; oral appendages lobate, simple, undivided; tentacles none; eyes at the end of long, club-shaped contractile peduncles. Respiratory orifice posterior, at the right side. Anal orifice separate, posterior; male organ under the right tentacle, female orifice at the posterior extremity of the body.

Fig. 544.



Onchidium carpenteri.

Shell none.

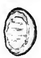
Jaw none.

Lingual membrane — ?

Onchidium carpenteri, W. G. Binn.—Among the mollusca from the Straits of De Fuca, Mr. Carpenter has detected five specimens of a shelless mollusk, which evidently belong to the genus *Onchidium*. Being preserved in alcohol, it is difficult to obtain any more satisfactory specific characters than the following: The body is oblong, with its extremities circularly rounded; the upper surface is regularly arched;

below, quite near the edge, the border of the mantle is readily distinguished, most of the under surface is occupied by the broad, distinct locomotive disk; the body is uniformly smoke-colored; in size the individuals vary considerably, the length of the largest being 5, the extreme breadth 3 mill.

Fig. 545.



Onchidium carpenteri, enlarged.

Onchidium carpenteri, W. G. BINNEY, Proc. Acad. Nat. Sci. Philad. 1860, 154.

Fig. 545 is drawn from one of the specimens collected at Cape San Lacas. They were too much dried to permit of anything more satisfactory.

Cat. No.	No. of Sp	Locality.	From whom received	Remarks.
4463	4	De Fuca.	......	Cab. series.

[This completes the series of North American land snails. The fluviatile and marine genera will be found in Land and Fresh-Water Shells of North America, Part II.]

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